ENGINEERING NEWS-RECORD

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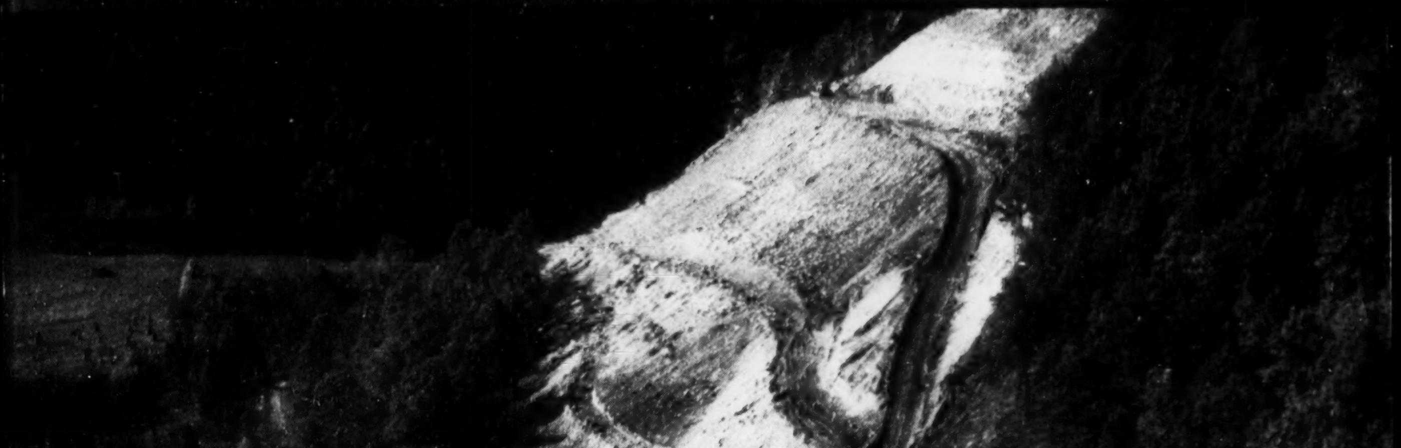

[illegible] on West Virginia [illegible]

★ [illegible] view needed by river developers [illegible]

★ [illegible] frame erected at low cost [illegible]

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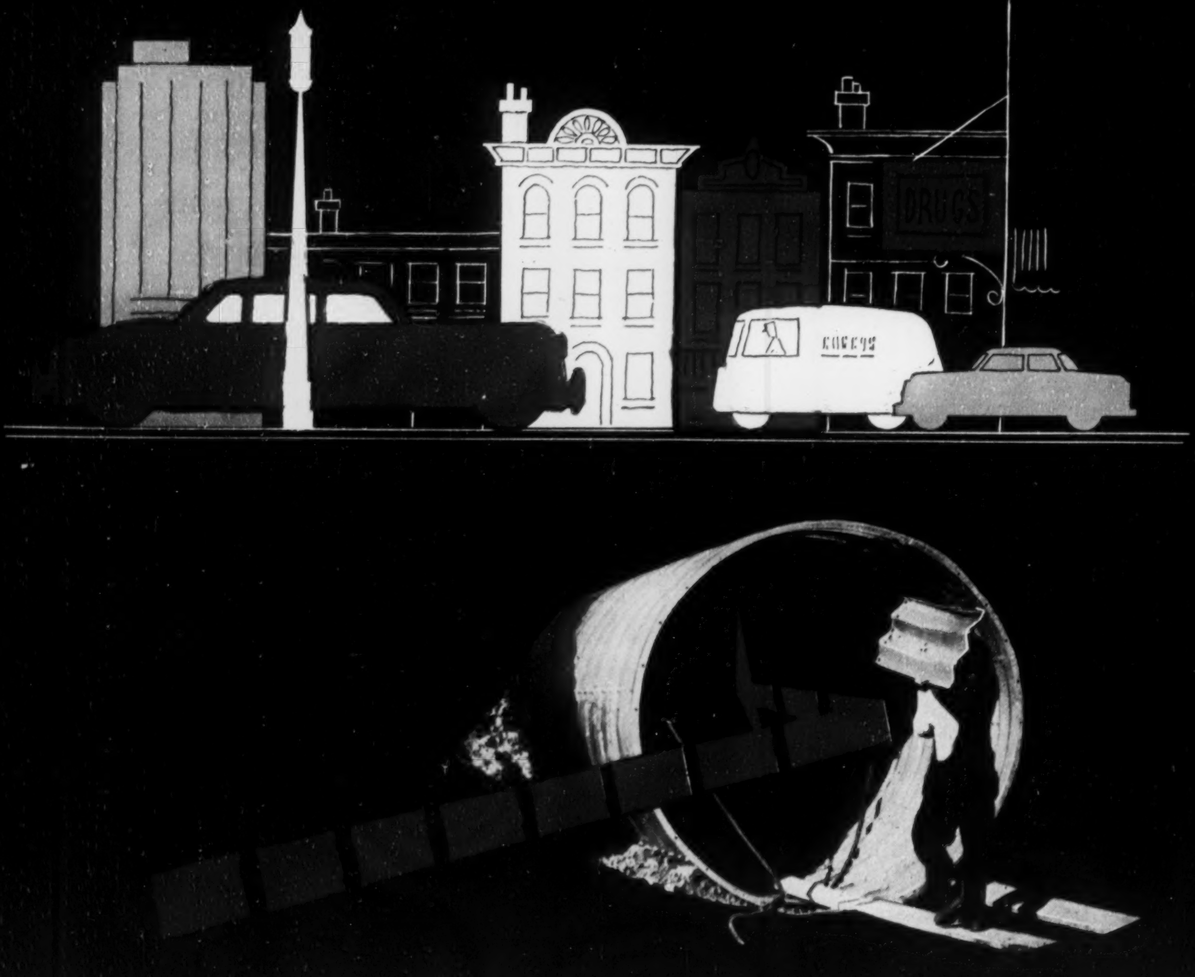

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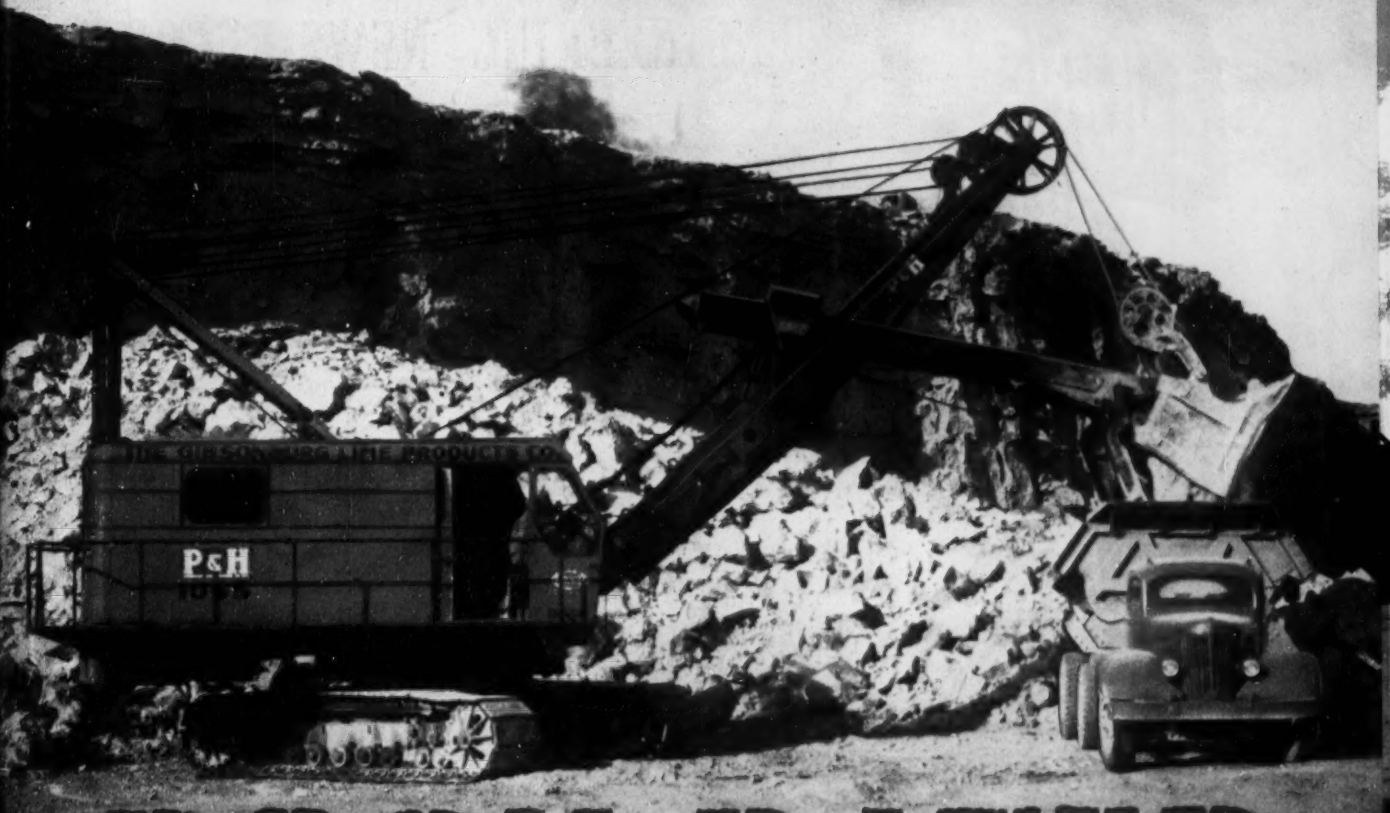
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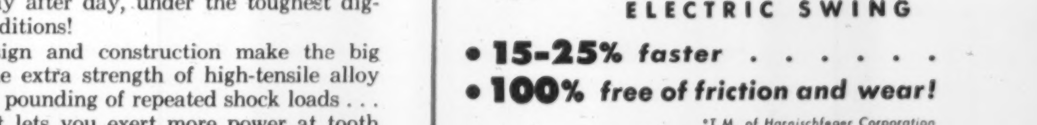
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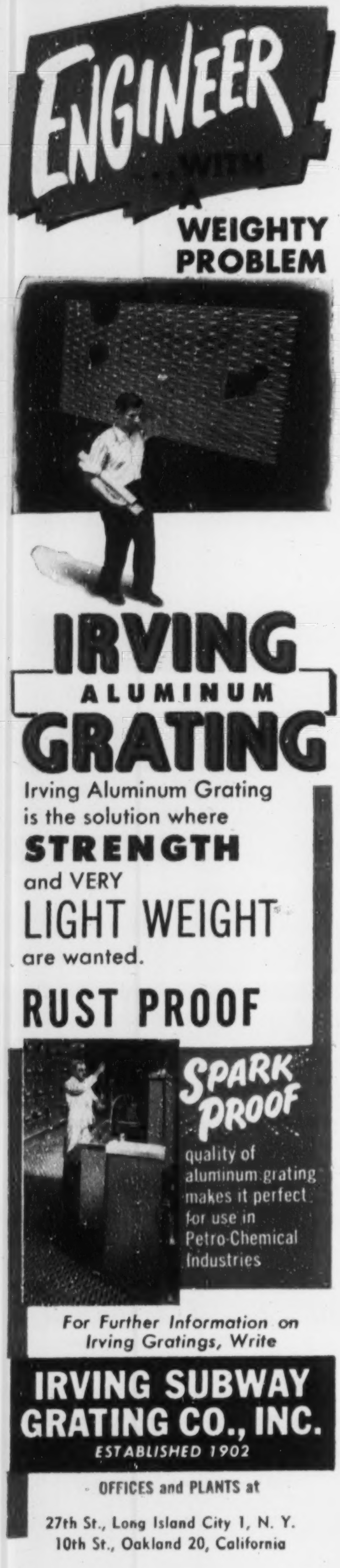
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Robert F. Boger
Publisher

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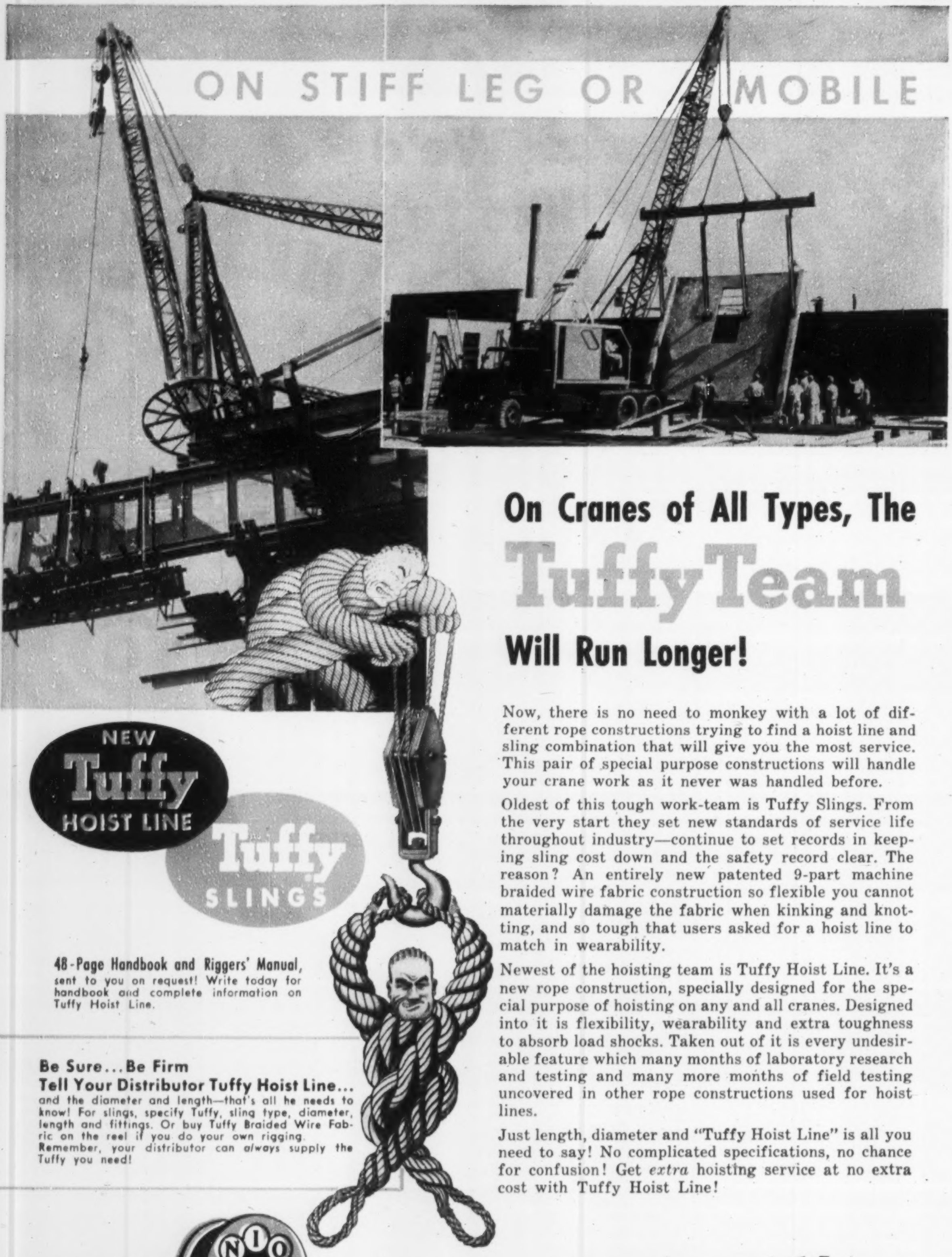
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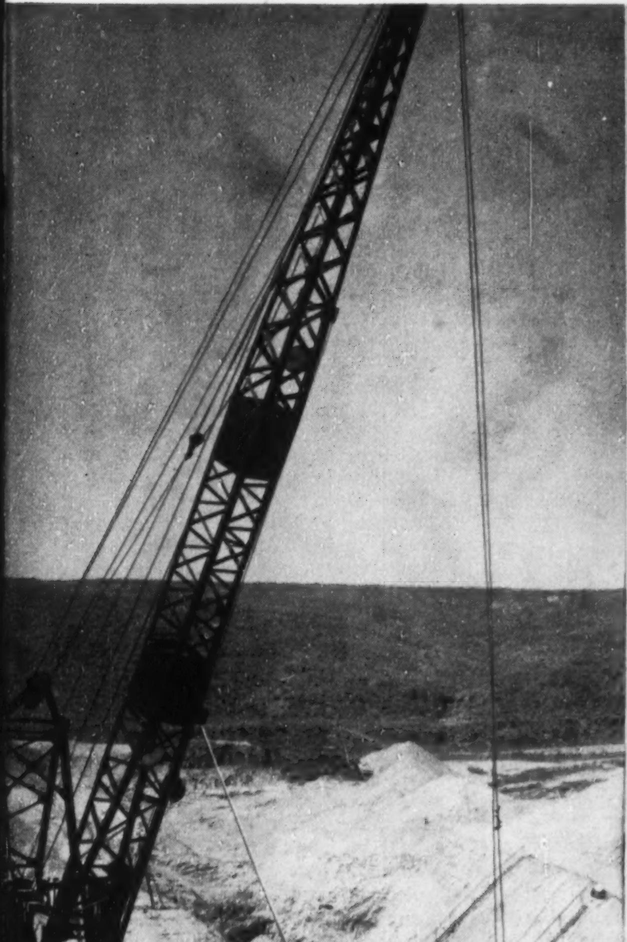

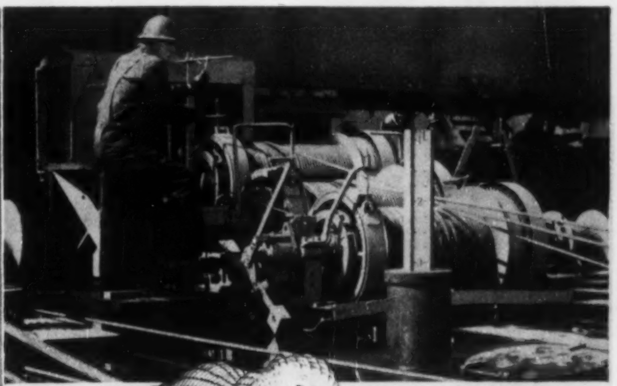

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READER COMMENT

Scrambled Caption

Sir: On page 23 of the March 11 issue of Engineering News-Record is a picture supposedly showing Clifford F. Hood, president of U. S. Steel Corporation, addressing the annual convention of the Associated General Contractors of America.

Mr. Hood is actually the gentleman seated at the far right, not the speaker.

R. J. Wilcox
Assistant Director of Advertising
U. S. Steel Corp.
Pittsburgh

[Editor's Note: Mr. Wilcox has caught our caption-writer in a bad case of reverse-itis. The speaker is, of course, C. P. Street, retiring AGC president, the man in the center is new AGC president McLeod, and Mr. Hood is at right.]

Why code amendment is slow

Sir: The Joint Committee on Building Codes is grateful for your editorial outlining the importance of its aims and setting forth some of the troubles it faces (ENR Dec. 31, 1953, p. 72).

The important fact that the committee's concern is to eliminate needless differences in the model codes—not to write a document to supplant them—appears to require the emphasis of periodical repetition.

For several reasons the translation of the committee's work into tangible results is a slow process. To begin with, each of the model codes, taken by itself, is an excellent document for its purpose. To select the best from each, or to find something better than any of them, is not an easy task. Each of the organizations sponsoring a model code has a justifiable pride in its own work. Each has a procedure designed to assure that all parties having a legitimate interest will be heard before changes are made in its code. Building codes are not written or changed overnight, nor should they be.

A list of the people who are contributing their time and talent to the work of the Joint Committee on Building Codes will be found to include practically all of the members of the professional societies who are particularly competent in this field. Some of them serve on the appropriate committees of their societies. Some represent segments of industry or other organizations vitally concerned with building codes. Some of them serve in both ways. The talent of those engineers, architects and scientists who have concerned themselves with building code work or who are specifically qualified is therefore available and is being used.

A. H. Baum
Chairman
Joint Committee on Building Codes
St. Louis, Mo.

River commission succeeds

Sir: A news report in ENR Dec. 11, 1952, p. 26, states that arrangements have been made for the setting up of a Missouri States Commission comprising representatives of the federal government and seven primary states to review and plan works to control the Missouri basin waters.

It may be of interest for you to know that in 1915 such a joint federal-state commission was set up in Australia to implement an agreement for the conservation and regulation of the waters of the River Murray and certain of its tributaries for irrigation, town water supply and navigation.

I wish to point out that at the time of the agreement there were bitter disputes between the states in regard to the Murray waters and it was expected that the River Murray Commission would have a very troublesome time. The agreement therefore provided that decisions must be unanimous on matters of major importance, and that in the event of lack of unanimity, the matters in dispute should be referred for arbitration to the Chief Justice of another State.

Actually no issue has ever been referred for arbitration because unanimity eventually has been reached between the commissioners on all matters. This is almost certainly due to the fortunate circumstance that right from the inception of the commission the federal and state governments chose engineers for their representatives, and these engineers approached their problems objectively rather than politically. The River Murray Commission is a "part-time" body, the commissioners being men holding the highest positions in the field of water supply in the service of their respective governments.

The programme of authorised works has been completed, but further extensions of works have now been recommended by the commission to the governments concerned whose agreement will now be necessary before these works can be carried out.

The River Murray Commission is not a constructing authority, its responsibility being to arrange for the

(Continued on page 10)

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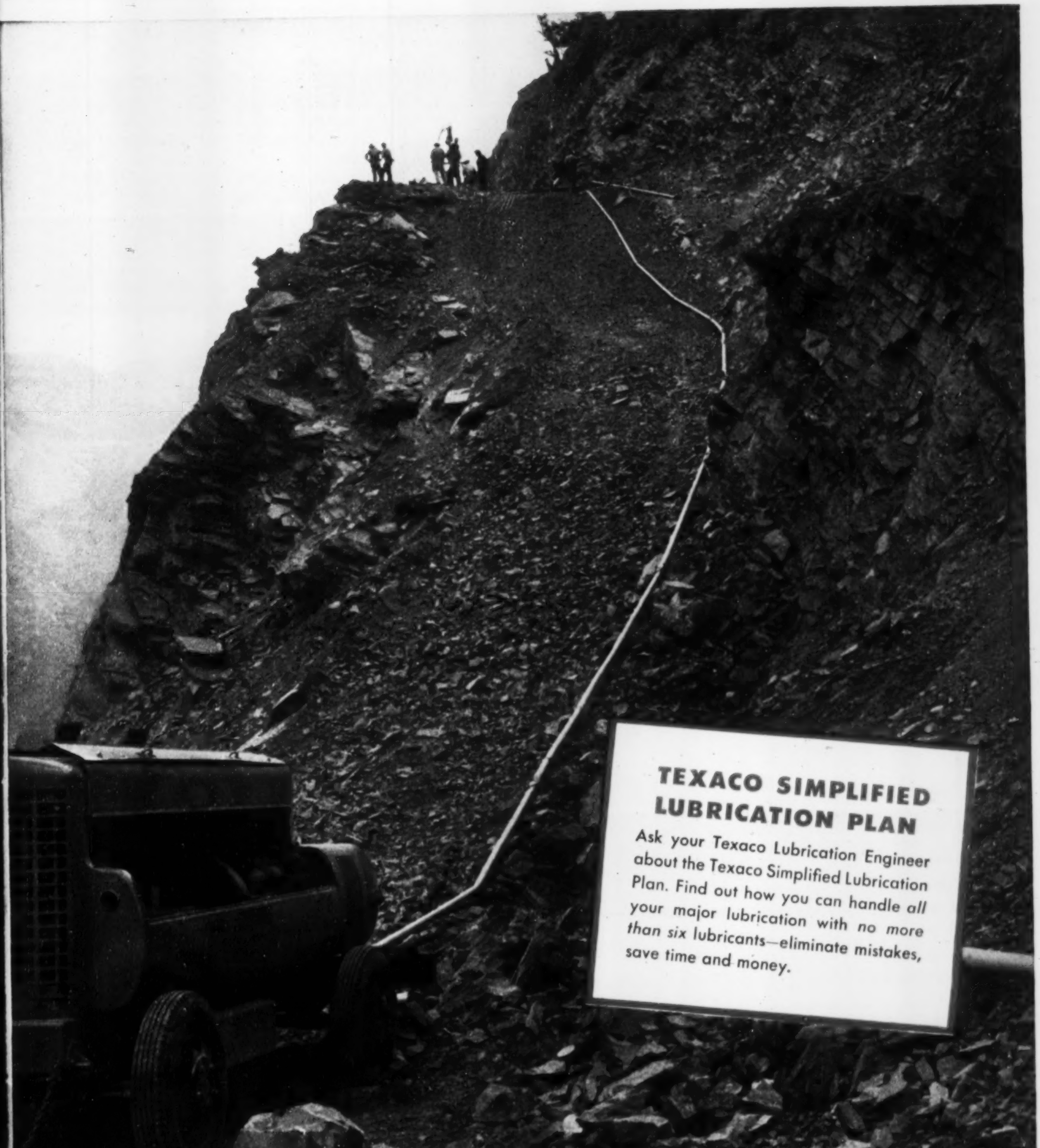

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construction of the works by the existing state authorities. These authorities design, construct and maintain the works allotted to them subject to the approval and direction of the commission. The capital cost of the works under the control of the River Murray Commission is met in equal parts by the commonwealth and the three states. The cost of maintenance is shared by the three states.

L. R. EAST,
River Murray Commission.
Melbourne, Australia.

Add to list

SIR: In the Feb. 11 issue of ENR on page 24 there appeared a list of engineering firms assigned to the Indiana Turnpike.

Under Section #7, Clyde E. Williams & Associates is shown and our firm's name is omitted. It should read:

Section #7—Clyde E. Williams & Associates, South Bend and Beiswenger & Hoch, consulting engineers, Akron, Ohio and Indianapolis.

O. L. BEISWENGER

Toll roads meet some needs

SIR: The following summarizes the comment of members of the Georgia State Highway Board, and other members of our staff, on questions raised in connection with V. T. Boughton's article on toll roads (ENR Jan. 7, p. 28). From experience to date in Georgia, toll highways could not, even if desired by the Highway Department, provide the answer to any large part of our road problems, because no toll-road project yet studied in Georgia has proved self-liquidating. At best, it was realized that toll financing would only provide means of securing SOME urgently needed mileage on major traffic roads now, and the cost amortized by users, leaving regular funds available for badly needed roads and bridges that can only be built as free facilities from highway revenues.

We believe the cost of feasible toll roads to be justified—if this is the only acceptable means of early financing.

It is highly desirable that coordination between states be obtained, since the great cost involved should provide for the greatest traffic service possible to obtain for all potential users.

It is our belief that reasonable discretion as to ending of toll should be available, because future developments could produce very sound—and critical—reasons for extensions, connections or similar additional facilities which could be provided better through con-

(*Continued on page 12*)

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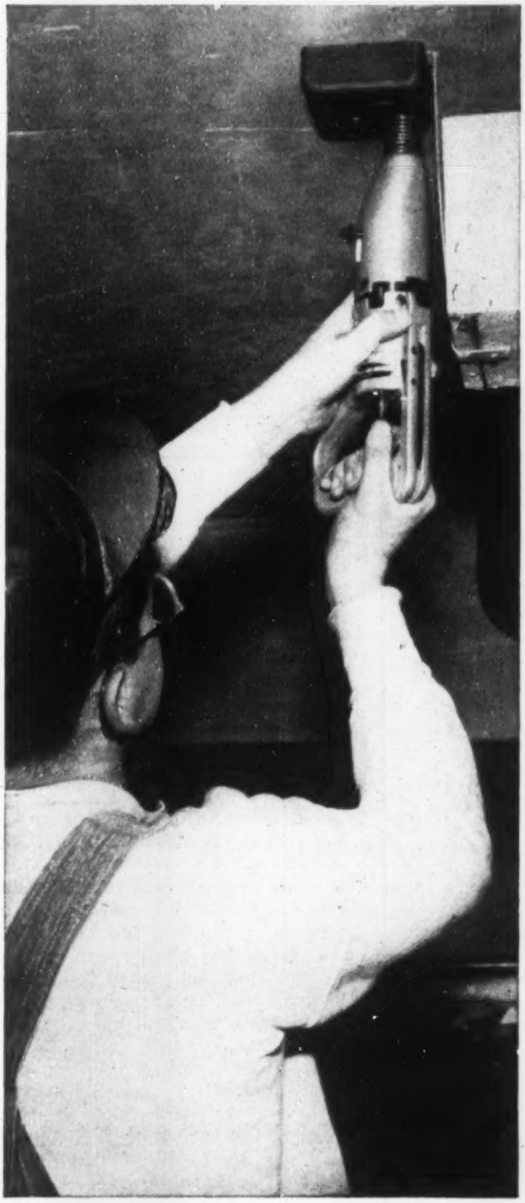

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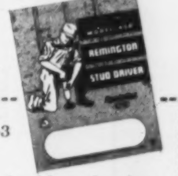

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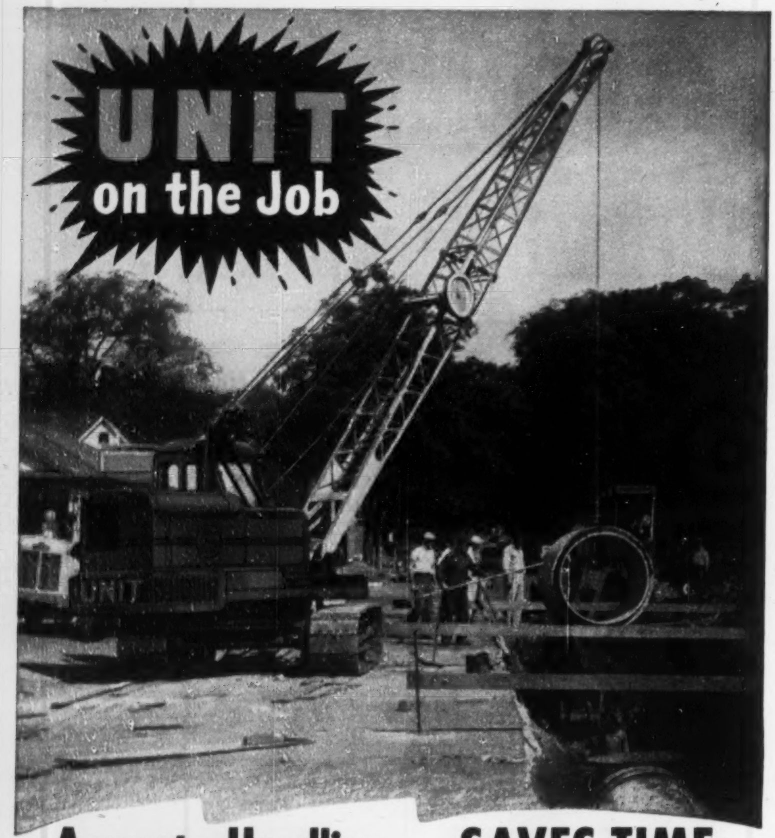

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tinuing tolls on the original project. No valid reason appears to warrant the continuing of tolls on one facility in order to pay for another entirely separate road.

Danger lies in over-emphasizing a toll project as offering the solution of traffic problems, even in an area directly served by the turnpike; because, like an urban expressway, the turnpike must, by its nature, create problems on other existing road and street systems that were not so critical before, and the public reaction could be more difficult to handle if the turnpike is actually to blame—and proves out as not the "cure-all" that it was thought to be.

Dixon Oxford
Member, State Highway Board
Atlanta, Ga.

Toll roads are needed

Sir: Your editorial "Toll roads are not the answer" (ENR Jan. 7, p. 29) leads me to say that this is not the view of those with any understanding of the national, state and local highway problems. Toll roads do offer a way to get some of the highest traffic-count highways built and in service in the immediate future, leaving the road user taxes available for improvement of other highways. To forego this method of financing would retard the whole highway program.

Those who want more and better and safer highways are going to have to face the facts if they are going to get them. With the federal debt at the breaking point, with state road-user taxes reaching the point of diminishing returns, construction of the high-traffic highways as free roads, while at the same time carrying on a program for modernizing the highway systems where toll financing is not warranted, is a financial and political impossibility within the foreseeable future.

While on the other hand, the full use of toll financing wherever feasible will educate by demonstration many, many people who now think our highways are adequate because they are all they know. The toll roads will create pressure for similar type highways and safer highways wherever their influence is felt and their functioning known.

Toll roads are news and will stimulate interest in better and safer highways everywhere, and make it easier to raise money by taxation for free highways. And with the tremendous financial load taken off the "tax" highway program by the toll roads, real

(*Continued on page 14*)

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Good Transportation

From standing bar stocks, reinforcing bars are bent and fabricated to requirements in our fab shop located under the same roof with rolling mills.

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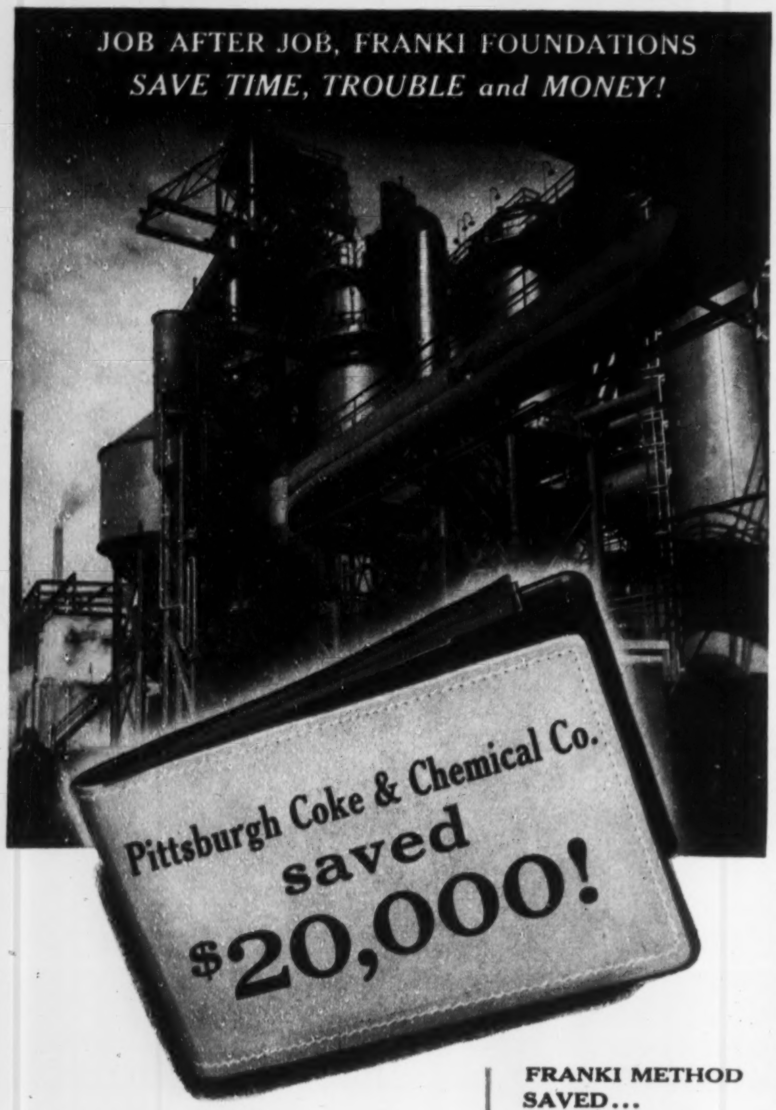
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... to name a few!

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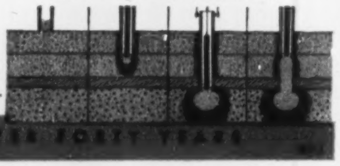

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progress can be made on the other highway systems.

It is time some interests that need an adequate highway system to prosper and expand in their business, quit pulling on the reins, get on the team and support the use of this method of financing that works to its fullest possibilities so that we can have the greatest extent of modern highways in service in the shortest amount of time throughout the United States.

H. E. Bailey
General Manager
Oklahoma Turnpike Authority
Oklahoma City

Buggies not for sale

Sir: In the article in your New Products section in the March 4 issue of Engineering News-Record, page 92, there is an error which we should like to call to your attention. The tractor and fork-lift combination information is correct but the Brick Buggies are not for sale and can only be leased for $55.00 per month. The information relative to the Mortar Box is also correct.

Chas. L. Feely
The West Brick Buggy Corporation

CALENDAR

Southeastern section AWWA, Poinsett Hotel, Greenville, S. C., March 29-31.

American Institute of Timber Construction, annual meeting, Jung Hotel, New Orleans, La., March 29-April 3.

6th annual highway short course, South Dakota State College, State College, S. D., April 7-9.

ASCE Pipeline Conference, Hotel Scharbauer, Midland, Tex., April 9-10.

Construction conference on "Walls, floors and roofs," Cleveland Engineering Society Building, Cleveland, Ohio, April 12.

Second International Congress on Irrigation and Drainage, Algiers, Algeria, April 12-17.

American Institute of Steel Construction, national engineering conference, Hotel Schroeder, Milwaukee, Wis., April 13-14.

Society for Experimental Stress Analysis, Netherlands Plaza Hotel, Cincinnati, Ohio, April 14-16.

Annual Road School, April 19-22; and Conference on Road and Street Traffic Control, April 22-23, Purdue University, Lafayette, Ind.

Conference on instrumentation in water, sewage and industrial waste treatment, Manhattan College, New York City, April 20.

Southern Industrial Wastes Conference, Hotel Shamrock, Houston, Tex., April 21-23.

American Society of Civil Engineers, Pacific Northwest Conference, Davenport Hotel, Spokane, Wash., April 22-24.

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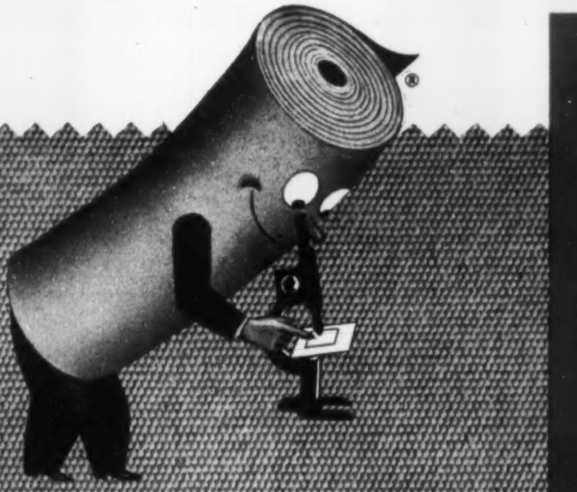

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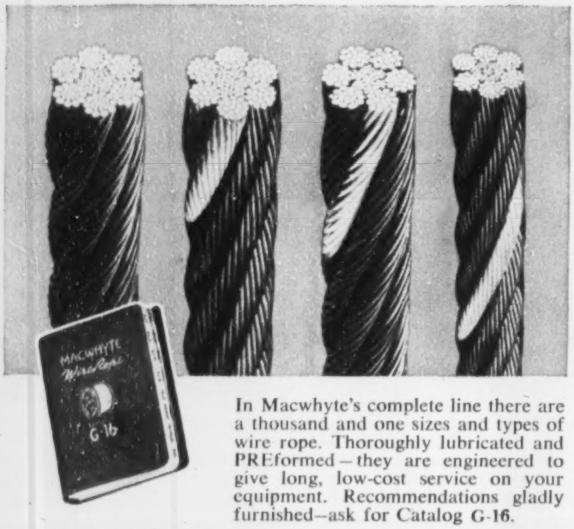

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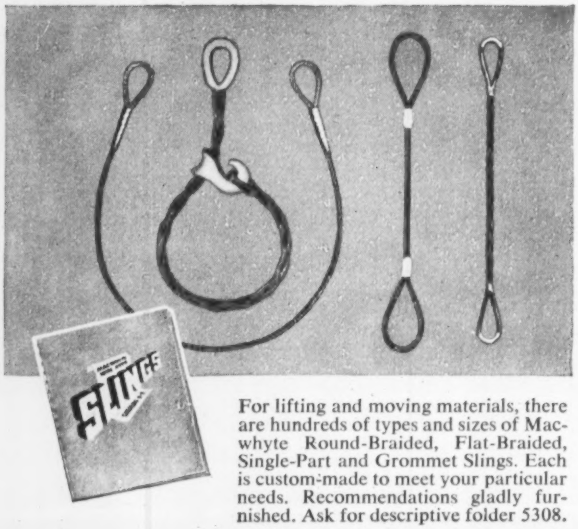

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MARCH 25, 1954

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THE CONSTRUCTION WEEK

FIRE LESSON—Although General Motors hasn't started to indicate all it will do under that billion-dollar spending program (ENR Feb. 11, p. 58) you can make a safe bet that plenty of the money will go into remodeling GM plants to conform to new fire regulations.

GM—like other manufacturers—hasn't forgotten the lesson of the costly fire at Livonia, Mich. (ENR Aug. 27, 1953, p. 96) last summer. And GM engineers will be following both their own and the Fire Underwriters' rulings when they make changes.

BRIGHT FOR ALUMINUM—Aluminum Co. of America sees a bright future for its principal product in building construction.

Said Alcoa (in its annual report for 1953): More than 100 buildings of basic construction similar to Alcoa's new Pittsburgh headquarters are now in planning stages or under construction.

ORE FUTURE—Further boost for the nation's steel reserves, and lots more construction, can come out of the plan of National Lead Co. and Republic Steel Corp. to "upgrade" southern iron ore.

Republic is now building a large-scale pilot plant near Birmingham, where production-scale studies will be made starting this summer. Objective is to produce iron ore concentrate sufficiently upgraded for use in blast furnaces. If the studies bring up something commercially practicable, other plants will follow.

RECRUITING—For the fifth year, American Institute of Steel Construction plans to award ten $1,000 scholarships to high school seniors wishing to follow careers as civil or architectural engineers.

Students will be nominated (as previously) by one of AISC's 290 member firms. Winners may use their scholarships in any of the 125 accredited civil or architectural engineering colleges in the U. S.

WEATHER INTEREST—Evidence of ever-growing interest in the weather as a factor of major business concern has come from two new sources:

The Building Research Advisory Board announced that members of its climatic research committee are beginning a survey of their respective organizations to find out what kind of climatic data is needed.

ROAD TAX NOTE—Highway users paid more for their share of highway costs in 1953 than in 1952. Said the National Highway Users Conference: Federal automotive excise tax collections for '53 reached an all-time high of $2.3 billion, compared with $2.1 billion a year earlier.

EXTRA *Quality*...EXTRA *Speed*

Six Firesafe Concrete Dormitories on Cornell's Beautiful Campus Erected with 'Incor' at Average Rate of a 5-story Frame every 11 Working Days

● Last Fall, six five-story dormitories—reinforced-concrete frames for utmost firesafety, speed, economy—were erected in record time on Cornell University campus: Foundations started August 13 . . . 1st floor concreted September 8 . . . last roof slab poured November 18, ahead of cold weather . . . 66 working days from first foundation to last roof slab (average, 11 days per building) . . . with foundations ranging from rock to caissons.

Good job planning and dependable 'Incor' high early strength assure extra speed at less cost. Extra quality, too: You see it in the easy-placing mixes . . . in smooth exposed concrete surfaces . . . in minimum drying shrinkage . . . and in the intangible but important difference that the crew, conscious of quality on an 'Incor' job, gets the most out of the concrete.

Over 25 years' performance, on job after job, clearly shows that 'Incor' produces more dependable results, at less cost, than by experimenting with "an extra bag of ordinary cement in the mix." One contractor summed it up by saying that he sleeps sounder at night with 'Incor'* on the job.

*Reg. U. S. Pat. Off.

MEN'S DORMITORIES,
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Ithaca, N. Y.

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Ready-mix 'Incor' Concrete:
RUMSEY-ITHACA COMPANY,
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DRYING SHRINKAGE OF CONCRETE

Tests of 3x3x12-inch concrete beams, cured in air of 50% relative humidity at 70°F. after 1 day in mold. Results are average of 3 specimens for each cement from batches mixed on different days.

Mix	Water	Drying Shrinkage—inches per 100 ft.				
bags/cu. yd.	gal./bag	3 d	7 d	28 d	3 mo.	1 yr.
Average 10 Lone Star Type I Cements (6-inch slump)						
3½	10.59	.156	.264	.516	.612	.648
4¼	8.27	.156	.24	.516	.624	.684
5	6.78	.18	.252	.528	.66	.696
6	5.62	.168	.228	.48	.636	.684
7½	4.65	.156	.228	.468	.636	.696
Average 10 'Incor' Type III Cements (6-inch slump)						
3½	10.48	.156	.252	.516	.648	.672
4¼	8.29	.156	.216	.48	.636	.672
5	6.9	.144	.216	.468	.636	.672
6	5.83	.156	.228	.444	.636	.684
7½	4.93	.156	.24	.48	.648	.708

Shrinkage of 'Incor' concrete is the same or less than concrete with Type I cements, through a wide range of equivalent mixes. 'Incor' develops greater strengths at early and later ages and is therefore better able to withstand shrinkage stresses. On the job, proper curing, starting at the earliest possible time, reduces shrinkage effects with all types of cement.

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WASHINGTON OBSERVER

Construction remains one of the mainstays of the economy regardless of the continued talk of recession.

A lag in industrial expansion plans is of some concern because this is one boom the Eisenhower team has wanted to keep rolling. Industrial expansion has been the mainspring of prosperity for the last three years. Figures from the Department of Commerce and SEC last week showed total spending plans down from $28.4 billion in '53 to $27.2 billion this year. Still, this represents only a 4% dip from the record of '53.

•

But housing construction stays high—which is the reason that housing officials haven't been getting anywhere with their pressure for lower down payments on FHA-insured housing. Then, there's the other potential of modernization. More such fix-up is planned, according to the Federal Reserve Board, but consumers on the average planned to spend a little less than they figured a year ago.

The commercial expansion outlook provides another bright spot in the construction picture·if businessmen hold to their plans, $8 billion will be spent this year, compared with $7.7 billion last year.

•

The Administration is now turned around on public works. That seems apparent from Eisenhower's complete support for the $1-billion project for the Upper Colorado (see page 21). It eventually will include several dams, hydro-power, flood control and irrigation features—a multi-purpose project bigger than California's Central Valley development. Politically, the Administration now has swung over to the same ground the Democrats plowed profitably for so long.

Voting the money is something else again, of course. Conceivably some funds could be gotten from Congress this year. Actually, however, it seems unlikely that any construction contracts can be let by July 1955. Most of the work up till then will be the completion of engineering plans.

•

Public works spending for fiscal 1955 holds about where it was in the budget Eisenhower gave Congress in January—about $3 billion, compared with $3.5 billion for the current year.

•

The fiscal 1955 military construction program won't get to Congress before June. Estimates being talked in the House Appropriations Committee total $2 billion to $2.5 billion in appropriations to carry spending over more than a one-year period. Best guess on actual spending in the year beginning July 1 still is around $1.1 billion.

•

Administration's big revision bill giving tax relief to business—including faster amortization of plant and equipment—got through the House by a close margin. Odds favor passage in the Senate, although Democrats continue their pressure for more tax relief for consumers.

•

Watch for a new regulation from the Defense Department affecting cost figuring on military projects. The new rule will set up identical criteria for all three services defining "true depreciation" of equipment. So it will be possible to figure depreciation on equipment the same whether it's for a Navy or an Air Force job. The Navy had been more liberal than the other services, heretofore.

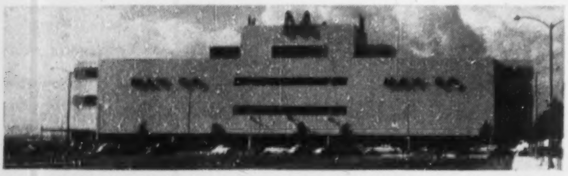
Coast to coast...Ryerson re-bars

Meet Construction Schedules

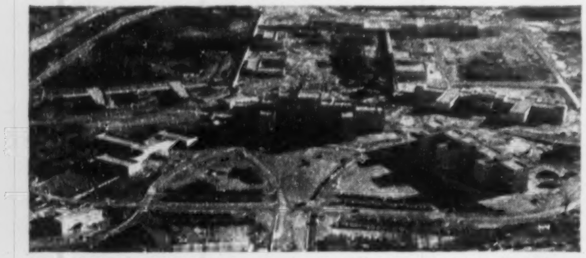
From Boston to Los Angeles, leading contractors depend on Ryerson for on-time deliveries of fabricated reinforcing steel and related products.

A few recent projects on which Ryerson supplied the steel are shown here. Their size, variety and widespread sites point up the fact that Ryerson can handle any type of job in almost any location. Re-bars are accurately cut and bent. Metal tags that won't blur or tear make identification easy. And to simplify purchasing *all* steel requirements can be ordered from one source.

On your next job contact Ryerson for a lump sum or average pound price.

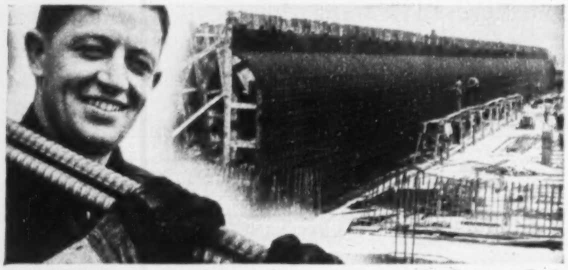


LOS ANGELES—T. S. Construction Engineers built this new May Co. department store—with the help of on-time deliveries of re-bars from Ryerson.



BOSTON—Gust K. Newberg Construction Co. was contractor for this new 1000-bed veterans hospital at Brockton, Mass. Ryerson supplied 4,000 tons of reinforcing steel for the project.

MILWAUKEE—In building the Milwaukee County Stadium (home of the Braves) Hunsinger Construction Co. played safe—ordered fabricated re-bars from Ryerson.



BROOKLYN—Thompson-Starrett Co. was contractor for the vast Owl's Head sewage treatment plant (shown here during construction) which will have a daily capacity of 160 million gallons. Ryerson supplied the reinforcing steel—4,000 tons of it delivered to Thompson-Starrett on schedule. And Ryerson service on reinforcing bars and accessories, spirals, wire mesh, etc., is helping to build similar plants in Sacramento, California and Detroit.

BUFFALO—Bates and Rogers Construction Co. depended on Ryerson for the reinforcing steel needed to carry a new elevated highway over waterways and industrial congestion. More than 2,000 tons of fabricated re-bars were delivered when needed.

CHICAGO—Neighboring multi-story apartments rise on Chicago's lake front with the help of dependable Ryerson steel deliveries. For the building in foreground contractors were: Crane Construction Co. and Carl E. Erickson Co. For building in background: Sumner S. Sollitt Construction Co.

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Upper Colorado River project gets Administration backing

President endorses basin-fund system to finance $1-billion development, including Glen Canyon and Echo Park Dams

The Republicans went over to public works this week in a great big way.

After a year of budget-cutting and "no new starts," the President came out strongly for a big billion-dollar basin project for the Upper Colorado River. Eisenhower's all-out endorsement will help authorizing legislation through Congress this session.

The President got squarely behind the Reclamation Bureau's Colorado River storage plan, specifically backing its two "key units"—the $421-million Glen Canyon Dam in Arizona and the controversial $176-million Echo Park Dam in Dinosaur National Monument. There are $304 million of irrigation projects and a $21-million recreational project in Dinosaur National Monument, giving the Upper Colorado program a total estimated cost of $923 million.

At the same time the President endorsed a basin-fund system of financing that would pay for all parts of the plan out of a basin project pool. This systematized basin-account method of financing is proposed in new legislation that the Budget Bureau is now busily drafting.

Major features of the draft have been revealed in a Budget Bureau letter to the Interior Secretary. The House Interior Subcommittee—which was ready to report its own Upper Colorado bill—has postponed final action until it can have a look at the Administration's measure.

A revolving fund to finance the basin project will get good support in Congress. It does not vary much from the basin account proposed in House and Senate bills. The essential difference is that the fund becomes almost a corporate entity for which the Interior Secretary would be responsible. It goes far beyond the mere bookkeeping arrangement set up under a so-called basin account.

• **Against tightening repayment**—Congressmen won't welcome a proposal of the Budget Bureau which would tighten up repayment standards for the irrigation projects in the Upper Colorado Basin. House committee members believe that the new standards would change basic reclamation law. They are against using the project as a guinea pig for establishing new criteria.

Echo Park Dam on the Green River near the Colorado-Utah state line would back water up the canyons of the Green and Yampa Rivers in Dinosaur National Monument, without submerging any important dinosaur tracks or relics. The reservoir would store 6,460,000 acre-ft behind a dam 525 ft high and would supply 200,000 kw.

• **Biggest in project**—By far the biggest storage and power unit in the Upper Colorado Basin plan is the Glen Canyon project. At the Glen Canyon site—just 13 miles upstream from Lee's Ferry, Ariz., the dividing point between the upper and lower basins—a 580-ft dam would form a reservoir with a capacity of 26,000,000 acre ft. The Glen Canyon power plant would have an installed capacity of 800,000 kw. Estimated cost of the project exceeds $421 million.

Under the Colorado River Compact of 1922, the main purpose of the upper basin storage project is to regulate river flow to assure delivery to the lower basin of 75,000,000 acre-ft in every ten-year period. Glen Canyon and Echo Park Dams are sufficient to carry out this purpose and to give the additional financial help needed for irrigation projects included in the present initial phase of the plan.

Other units proposed for later addition would increase the ultimate cost of the upper basin development to more than $1.4 billion.

Marked for deferred authorization by the Budget Bureau was the big Shiprock irrigation development for the Navajo project, including the Navajo Reservoir.

This proposed development—which has been estimated at nearly $180 million by the Budget Bureau—was second in size on the Reclamation Bureau's list of recommended irrigation projects. The remaining 12 projects, including the $230-million initial phase of the Central Utah project, were approved for "conditional authorization" by the Budget Bureau.

Senate committee acts on highway aid; Table Rock Dam OK'd by House group

Federal highway aid legislation made further progress in Congress last week and the Commerce Department gave rise to hopes that federal aid to municipal airports might be restored at least in limited form. Table Rock Dam in southwestern Missouri also got the green light from the House Public Works Committee last week.

The Senate Public Works Committee planned to report this week a federal-aid highway bill that recommends larger sums than the House-passed McGregor measure. Its action was particularly significant on four counts:

• Elimination of the House provision that ties aid for the interstate system to the federal gasoline tax.

• Endorsement of the McGregor compromise—included in the House bill—for apportioning interstate aid half on the old Section 21 formula and half on a straight population basis.

• An increase in regular federal aid to $760 million and allotment of $150 million to interstate routes—for a total of $910 million, as compared with $800 million in the House bill.

• Endorsement of the House-adopted matching ratio for interstate construction, making it 60% federal and 40% state instead of 50-50.

• **Allocations differ**—Regular federal aid in the Senate measure would go $342 million to the primary system, $228 million to the secondary and $190 million to the urban. The Senate bill further would earmark these funds definitely for the specified systems; it deletes the House-approved section that permits each state to transfer 25% of the apportioned funds among the three systems.

The $150 million proposed for interstate aid in the Senate bill is $50 million less than the $200 million voted by the House. But it is slightly more than the total of $135 million a year which would have been available for interstate routes under the original bill introduced by Sen. Francis Case in the Senate public works group. Overall federal aid in the new bill also exceeds Case's total (ENR Feb. 25, p. 27).

In the Senate measure, control over projects on the secondary federal-aid system would remain the responsibility of the Secretary of Commerce and the Bureau of Public Roads, as in the House bill. The Senate version also retains two sections ordering the Secretary to make a study of toll roads and another study of utility relocations on federal-aid projects.

Prospects are beginning to brighten, too, for resumption of federal aid to local airports.

• Airport aid asked—On recommendation of its Transportation Council, based on an airport panel study, the Commerce Department has changed its policy and asked the Budget Bureau to approve some fiscal 1955 money for new local airport projects.

Regular Commerce Department appropriations have been voted by the House and will soon be up for hearings before the Senate committee. The House-passed money bill contains no funds for new Civil Aeronautics Administration federal-aid airport commitments. If Budget Bureau approval comes through in time, some money for new airport aid could still be included in the Senate bill. Otherwise, any approved funds would have to be submitted in a supplemental appropriation measure.

CAA will tighten up its criteria for airports to receive any added federal aid that Congress might vote. Broadly stated, aid would be limited to airports of national aeronautical importance, and terminal buildings would be excluded from federal assistance.

• Table Rock Dam—Table Rock Dam and its 200,000-kw power plant on the White River in southwestern Missouri seemed slated for a clean-cut construction start this year. The job can get going, however, only after the Corps of Engineers determines definitely that the power rate will be 4.7 mills or higher—sufficient for a 50-year payout on the heavy cost allocated to power.

Green light for the job came last week from the House Public Works Committee, which approved the $78.6-million project. That action cleared $2.3 million of previously appropriated money for spending—provided the Army Engineers hold fast to their figures on cost allocation and annual charges for power. Any changes would have to be approved by the House Appropriations Committee, which backed out of last year's stop order on Table Rock by shifting the decision on the big project to the public works group.

Fly-ash use as concrete additive questioned by building inspectors

The concern of a Long Island, N. Y., building inspector over the difficulty of maintaining rigid control of mixing and placing fly-ash concrete in building construction has set off a series of bitter debates.

When the battle subsides, conclusions reached may furnish contractors, concrete firms, fly-ash suppliers and municipal officials with answer to the many questions which have arisen over the use of fly-ash.

In January, Fred Davis, assistant building inspector of Garden City, N. Y., noticed unusual color in the first lift of foundation pour during a routine inspection of a housing development in his city. Investigation by Davis and Building Inspector H. L. Moulton disclosed that fly ash had been used as a replacement for some of the Portland cement in the ready-mix concrete.

• Cause for concern?—Since the Garden City building code does not treat the use of fly ash as a replacement or an admixture, Moulton immediately notified the contractor and concrete supplier that fly ash could not be used in his city until he had investigated more thoroughly its effects on building construction. At the same time, he specified that until further notice only light-colored cement is permitted to be used in concrete delivered to jobs within his jurisdiction.

When Moulton notified the Building Inspectors Assn. of Nassau County (BIANCO) of his concern about this matter, it was decided that the association would conduct hearings on fly ash, inviting cement interests and ash suppliers to air their views on its use.

Meanwhile, Davis was having tests performed on samples of both the fly-ash concrete section and the subsequent straight Portland-cement portion of the disputed foundation. He also conducted Swiss hammer tests of the two lifts to determine the ultimate strength of the concrete. (The hammer measures rebound, which indicates the elasticity of the concrete, which in turn is a measure of the strength.)

• Here's what he found—Using the Swiss hammer (Moulton finds the hammer test to be accurate to within 10%) he determined that the 17-day strength of the fly-ash section was about 800 psi as compared with about 1,800 psi for the straight mix.

At 30 days, the fly-ash section tested at about 1,700, and the regular at 3,000 psi. At 69 days, a test indicated a strength of about 4,000 psi for the regular concrete as against 2,250 psi for the fly ash. Allowing for the 10% deviation, the latter at that time was only then attaining the 2,000-psi, 28-day strength requirement of the Garden City code.

• Cement interests oppose practice—BIANCO conducted a hearing at which representatives of the Portland Cement Assn. and of a local sand and gravel company were heard.

Both groups are bitterly opposed to the use of fly ash as a replacement for cementitious ingredients in structural concrete.

They claim:

(1) That fly ash should be used—if at all—as an admixture with the recommended standard mixes for the various concrete uses.

(2) That economy—even when used under fly-ash suppliers recommendations—is lost through the increased period of time between the pour and the form stripping.

• Proponents vehement—At a subsequent hearing (Mar. 15) Henry Fried, of the Mineral Mix Products Corp., New York City, mustered supporters in defense of strictly controlled replacement of Portland cement by fly ash in varying degrees up to 20% by weight.

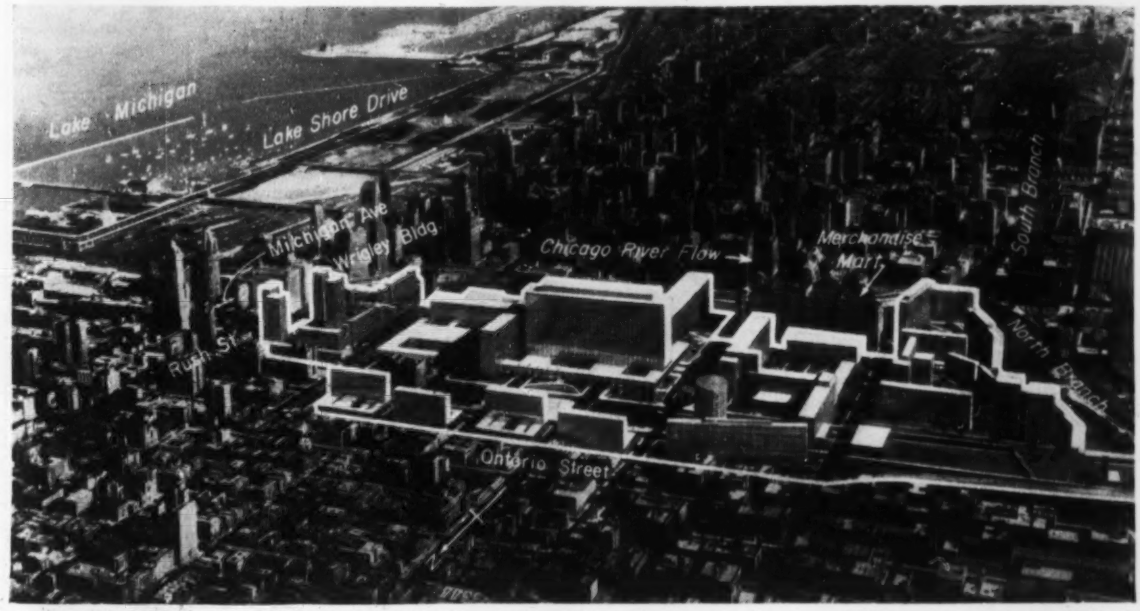
Hugh Quinn, councilman from Queens County, New York City, under four administrations and sponsor of the bill embracing the use of fly ash under the New York City Building Code, enthusiastically supported the replacement principle. (The city's Board of Standards and Appeals has not, as yet, accepted the material, so it is not now in general use in the city.)

• Utility spokesmen speak—A. S. Pearson and T. R. Galloway, engineers with the Consolidated Edison Co. of New York, also were on hand to support use of fly ash in concrete.

Their claim is:

(1) That the fineness and spherical shape of the particles imparts a "ball bearing action" allowing concrete greater workability in chutes and forms.

(2) That the chemical action between amorphous silicon and aluminum oxides in the fly ash and hydrated lime of the setting concrete results in additional cement compound, rendering this type of concrete superior to ordinary concrete in compressive, tensile, flexural and bond strength.



CHICAGO'S $400-MILLION REDEVELOPMENT, bordered by white line, will occupy 151-acre site along the Chicago River, and incorporate 5,000 apartment units, college facilities for 20,000 students, and a government administration center.

Chicago unfolds big redevelopment plan

$400-million, 151-acre project just north of Chicago River would help revitalize city's central business district

One of the country's most ambitious redevelopment projects, which would cost an estimated $400 million, was announced in Chicago last week. It is called the Fort Dearborn Project after the old Indian outpost that preceded Chicago, and which stood only a stone's throw from one corner of the site.

The proposal provides for reconstruction of 151 acres of sub-standard property on Chicago's near north side with a government administration center, a city campus for the University of Illinois, 5,000 apartment units, an esplanade which also would furnish covered parking for 6,000 automobiles, and auxiliary facilities.

• **Breathtaking in scope**—The plan is of such magnitude as to fire the imagination of the most progressive city planner. It proposes the most sweeping changes in the Windy City's central business district since 1871 when Mrs. O'Leary's cow kicked over the lantern that caused the great $192-million Chicago fire which destroyed 18,000 buildings.

Located just north of the Loop, the 151-acre site proposed for redevelopment extends along the north bank of the Chicago River. It is bounded on the east by Rush St.—just one block from Michigan Ave.—on the west by the North Branch of the Chicago River; and on the north by Ohio and Ontario streets.

About 80% of the 800 existing dwelling units in the area are dilapidated or without private bath or water. There are numerous cheap hotels, most of which are in a sad state of disrepair. And 95 acres, or 63% of the area, is in vacant land and streets and alleys.

Chicago planners believe the proposed project will do as much for developing that area along the Chicago River, as did Daniel H. Burnham's master plan of 1909 for developing the city's lake front.

Sponsors of the project, a group of civic-minded citizens, anticipate that the site will be acquired and cleared by the Chicago Land Clearance Commission and that it will qualify for federal assistance under Title 1 of the Housing Act of 1949.

City, state and federal funds would be used to finance the acquisition and clearance of the site, at a cost of about $40 million, if the project qualifies under the Illinois Housing and Redevelopment Legislation of 1947, and the Federal Housing Act.

If such three-way financing is arranged, the federal government's share would be $28 million; that of the city and state, $6 million each.

In brief, here are the main elements of the project:

• **Fort Dearborn Square**—A government administration center would cover 62 acres and cost $165 million. Its main units would be a city hall; federal, state and county buildings; a Hall of Justice for the consolidated courts; public library; and Hall of Records.

There also would be a municipal building for such agencies as the Chicago Sanitary District, the Chicago Transit Authority, Chicago Housing Authority, and the Chicago Land Clearance Commission.

Currently, the government offices are located in 85 different places in and around the Loop. All of these agencies, however, would not be moved to the new development.

The construction program for Fort Dearborn Square ultimately would provide 7,500,000 sq ft of floor area—based on the 1975 government requirements this includes 6,000,000 sq ft of usable office space.

• **University campus**—Part of the gigantic redevelopment project would be a city campus for the University of Illinois. It would be located on a 33-acre site, and furnish facilities for 20,000 students. Buildings and land would cost about $88 million—with a programmed area of 4,000,000 sq ft.

Inclusion of this element in the overall project is based on the fact that the University of Illinois is studying the possibility of a Chicago campus, capable of furnishing quarters for a comprehensive four-year curriculum.

• **Apartment dwellings**—One of Chicago's urgent needs is an increased

. . . Chicago redevelopment plan

number of clean, modern apartments close to the business area. This would go far toward stabilizing the employment situation in the central business district. The Fort Dearborn Project envisions 5,000 apartment units, in high-rise elevator buildings. They would be located on 54 acres, around the periphery of the development.

Costing about $92 million in private funds, these apartments would range from efficiency units on the west to larger, more luxurious units near Michigan Ave. The majority would be in the medium and efficiency sizes.

• **A grand esplanade**—One unique feature of the plan is an esplanade, which would be located one level above present street level and would cover about 2,400,000 sq ft of area, exclusive of buildings. It would cost an estimated $15 million.

This esplanade would provide a natural parking facility for 6,000 automobiles at the present street grade. Also, it would furnish an effective separation between pedestrian, taxicab and public vehicle traffic serving the development on the esplanade level, and the north-south through-traffic on the existing grade.

Esplanade design minimizes the amount of excavation for the project while at the same time allowing for future expansion of parking service and storage facilities through excavation. In addition, it allows underground service access below existing street levels to adjacent railroad and truck routes.

• **Service facilities**—The plan calls for a $15-million steam distribution system to serve the various units in the multi-million-dollar project. Occupying about two acres, it would be designed to minimize soot and smoke.

Several basic municipal and private service facilities will be included for the working and residential population of the development. These include restaurants, grocery stores, drug stores, a public school and fire station.

• **Readily accessible**—The Fort Dearborn Project would be served conveniently by several forms of transportation. Excellent entrance and egress to the Northwest Expressway and the Outer Drive would be provided by the new expressways along Ohio and Ontario streets which border the north edge of the development. The rest of the city would have access to the site by the Congress St. Expressway along the upper and lower levels of the new Wacker Drive Extension.

The site would be well served by Chicago's existing and proposed rapid transit system. State St. Subway passes under the site on the east. The proposed Wells or LaSalle St. Subway would cross the site on the west. And stations of the Milwaukee Ave.-Lake St. Subway are only two blocks from the site. The new Greyhound bus terminal is only two blocks south of the site. And parking facilities on the site should greatly relieve the Loop parking situation.

• **Architects and engineers**—Skidmore, Owings & Merrill, architects and engineers, Chicago, made the preliminary studies and prepared the overall plan. Arthur Rubloff, real estate developer, is credited with being the father of the basic idea for the Fort Dearborn Project.

Redevelopment suit

Question of resale to private interests goes to U.S. Supreme Court

Construction men with an interest in urban redevelopment projects may have an important stake in the outcome of a battle shaping up in the U. S. Supreme Court. A suit by a recalcitrant landowner in the District of Columbia, challenging the constitutionality of the D. C. redevelopment plan, may influence similar programs for which legislation has been enacted by 32 states.

The case arose when a department store owner tried to stop seizure of his property by the D. C. Redevelopment Land Agency. His property lies within a 76-acre plot marked out by RLA for its first project under the D.C. Redevelopment Act of 1945. The law provides for the rebuilding of slum areas, assembly of land—by purchase or condemnation—and resale of the land to private interests for redevelopment.

• **D. C. law upheld**—A special three-judge court already has upheld the constitutionality of the law and dismissed an injunction suit. It held that the power to clear slums is within government police powers to protect public health, safety, morals and welfare.

The department store owner is asking the Supreme Court to reverse the D.C. law because it uses these police powers to condemn property for resale to private owners after existing buildings have been torn down. (Right of a redevelopment and housing authority to condemn private property even though part of it may be resold eventually to other private owners now has been upheld by the courts of 13 states. Only Florida and Georgia have ruled to the contrary but in those cases the entire areas were to be sold to private interests).

• **Test of broader issues**—Although the D.C. law was upheld, the federal government, representing RLA and the D.C. government, also is appealing. It seeks a broader ruling on redevelopment, taking the position that the D.C. decision restricted application of the law (police power to clear slums) so that, as a practical matter, the whole purpose of the redevelopment plan may be frustrated.

So the Supreme Court—which never has ruled directly on constitutionality of the taking of property for redevelopment purposes—not only can clear the way for the District of Columbia's program but possibly also enlarge the areas of action open to officials charged with working out integrated slum clearance—redevelopment plans throughout the country.

The D.C. law is directed not only at slum clearance—which it defines—but also redevelopment of "blighted" or "deteriorated" areas—which are not defined. The three-judge court said that so long as land is seized for the public purpose of eliminating slums—even though the land is later sold for private use, such as apartment houses, theaters or businesses—it is a constitutional seizure within the rights of eminent domain.

But where no slum exists or where only a part of a project area is slum, legislatures have no power to direct seizure of the entire area because it is "out-of-date," "blighted," or "18th Century." The judges noted that it would be difficult to think of a village, town or city in the U. S. which a group of artists, architects and builders could not improve vastly if they would tear down the whole community and rebuild it. But, said the court, this kind of "pleasant accomplishment" is not a public purpose which validates seizure of private property. The test must be injury to public health, safety, morals or welfare.

But the government will argue that this is too narrow an approach to a neighborhood which is part slum, part only "out-of-date." The argument is that a redevelopment agency would be forced to take piecemeal approach to such areas, leaving isolated structures in the hands of balky landowners. This would prevent assembly of all the land in such areas, and would continue, says the government, some of the very factors producing slums which a redevelopment program is designed to end.

Many sanitation, water supply problems are begging for solution in Southeast

Opportunity knocks for sanitary engineers in the nation's Southeast. Industrialization and population growth have posed water supply and disposal problems, calling for engineering experience which the region has not yet fully gained.

There is an eager search for answers as evidenced by last week's third Southern Municipal and Industrial Wastes Conference held at North Carolina State College in Raleigh.

The Southeast is experiencing in a relatively short period the growing pains of industrialization that much of the rest of the country long has had well behind it. With land, labor, power, raw materials and transportation all in generally good supply, the special worry of conferees last week was water. While water of good quality is a fairly abundant resource of the area; the chief concern is to keep it abundant by thoughtful use.

• **Need for research**—Many of the technical problems confronting the region were aired in the two-day sessions on municipal and industrial (mainly textile and paper) wastes. Special emphasis was put on industrial participation in construction and operation of municipal sewage works.

Speakers stressed the need for both basic and applied research and the importance of the pilot plant as an essential step for an industry seeking a waste treatment solution.

"Industrial research points the way to industrial expansion" was the way keynoter Ralph E. Fuhrman put it. Mr. Fuhrman, deputy director of sanitary engineering for the District of Columbia, called upon industry to raise the ceiling on its own growth-through-research. Prof. H. Heukelekian from Rutgers University stressed the serious lack of enough qualified men for basic research in the educational institutions.

• **Financial and policies**—Conferees were especially interested in financial aids to industry and municipalities for pollution abatement work.

Wisconsin's tax relief to industries on such facilities (ENR July 9, 1953, p. 24) was reported by L. H. Enslo, editor of "Water and Sewage Works."

Ben Cone, of Cone Mills in Greensboro, claimed that if states were going to police pollution abatement, they ought also to provide some financial aid for the job. In discussion, S. I. Zack of the Harrisburg firm of Gannett Fleming Corddry & Carpenter told how Pennsylvania is doing just that. (The state last year allocated $2 million for the annual payment of a 2% of construction cost—operating subsidy to all municipalities with sewage works of interceptors built since 1937.)

This third annual conference indicated as had the second (ENR Mar. 26, 1953 p. 26) that North Carolina and nearby states are continuing to attract industry. (ENR contract reports showed the Carolinas still forging ahead in dollar volume of industrial building last year, in spite of a slowdown since 1952 in some of the states farther south.)

Some speakers at this conference were troubled with method and money problems that have known solutions.

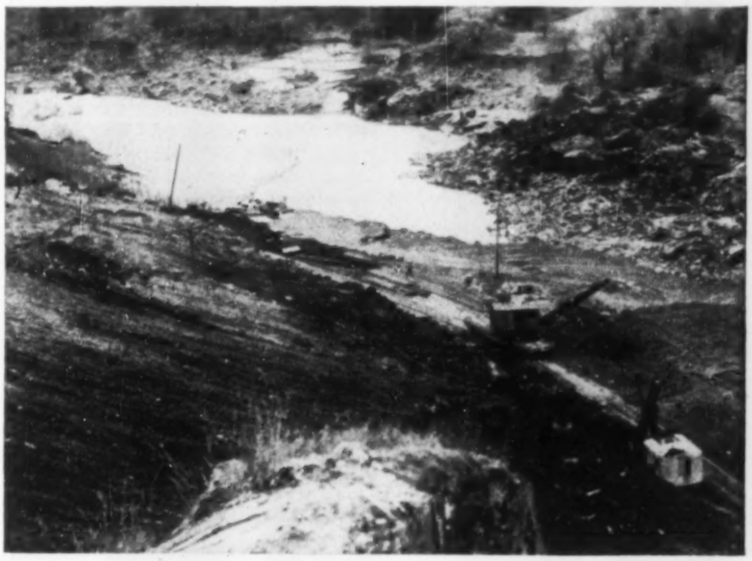
Insurance firms sued over penstock damage

Pacific Power & Light Co. has filed suit in Federal District Court, Portland, Ore., against five insurance companies to recover $1,050,000 the utility claims it lost as the result of penstock tunnel damages during construction of the Yale project on the Lewis River in southwest Washington.

Named defendants are Universal Insurance Co., Firemen's Fund Insurance Co., Scottish Union and National Insurance Co., Glens Falls Insurance Co., and Saint Paul Fire and Marine Insurance Co.

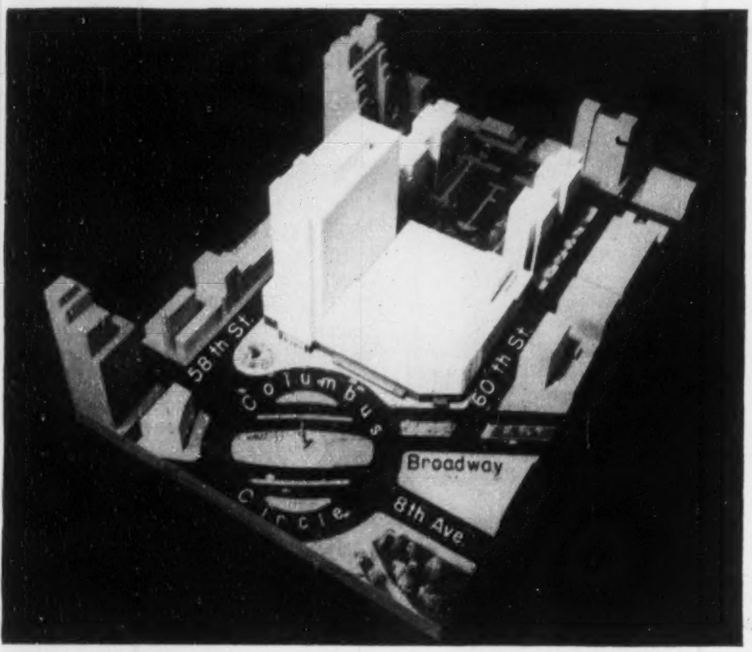
PPL contends it purchased policies from each of the firms in September 1951, at the start of the Yale work, to protect the utility against any loss of net revenues due to delay in completing the plant by reason of "direct physical loss, destruction or damage" and against the expense in reducing the period of such delay.

Between Dec. 15, 1952, and March 1953, parallel penstock tunnels were damaged by what PPL engineers termed at the time was an unforeseeable and minute movement of the mountainside rock structure. The penstocks developed hairline cracks in the concrete lining, necessitating installation of steel linings (ENR May 7, 1953, p. 24). PPL claims the repairs delayed the project from about Jan. 15, 1953, until Nov. 14, 1953, causing a revenue loss of $1,465,235 and an added expense of $311,944.



Railway shovels 10,000 cu yd of earth slide daily

Shovels have been working round the clock to protect Northwestern Pacific Railroad tracks from being overrun by an earth glacier, moving at the rate of three feet per day, at a spot 81 mi south of Eureka, Calif. Eight bulldozers, two work trains, a steam crane, two power shovels, and 70 men have been moving 10,000 cu yd of mud daily from one side of the tracks and dumping it into the Eel River on the other side. Costing $3,000 a day, the work entails terracing the face of the glacier, digging ditches at various levels, and draining off the accumulated water in attemps to stop the movement of the mud slide. The glacier rises to a height of 1,700 ft above the track and was set in motion on Feb. 22 by rains that pelted the area with 22½ in. of water in 15 days. One of many slides along the NWP route, an earth slide at the same place blocked the track for 73 days in 1938, and earth sliding has plagued the railway there for 40 years. Traffic was not interrupted.



NEW YORK CITY'S $30-million Coliseum will face on Columbus Circle. Office tower, at left, will rise 20 stories above four-level exhibit hall. Two apartment buildings at rear will be added later by private developers.

Coliseum construction to start in April for New York's first public exhibit area

Excavation and foundation work is scheduled to start April 1 for a $30-million, air conditioned building that will house a four-level, nine-acre Coliseum at Columbus Circle, New York City. To be the first public exhibit area of its kind in New York, the present plan represents a change over a $20-million coliseum previously envisioned (ENR Nov. 26, 1953, p. 25).

Capable of handling several major exhibits or seating 10,000 people, the Coliseum will have a block-and-a-half-long lobby as wide as a city street. A 20-story office building will rise from one side of the Coliseum area and parking and off-street truck loading facilities will be incorporated in the two basement levels. At some later date two 14-story apartment buildings, to be financed by private capital, will adjoin the back of the Coliseum.

The project will occupy a master block formed by closing off West 59th St. from Columbus Circle west to 9th Ave. And, 58th and 60th Streets will be widened to compensate for the change. Construction in the heart of Manhattan at Columbus Circle was made possible as part of a New York City slum clearance and replanning program under the Federal Housing Act.

Basement and sub-basement of the structure will have a parking capacity for 850 vehicles, and the office building tower—an integral part of the Coliseum—will contain 540,000 sq ft of air conditioned floor space.

New York's Triborough Bridge and Tunnel Authority will build the project and will pay the city $42,000 a year in lieu of taxes and also will pay to the city all income over annual net revenues of $1,225,000. Leon and Lionel Levy are architects for the structure with Aymar Embury II, Eggers and Higgins, and John B. Peterkin as consulting architects, all of New York. Jacob Feld is structural engineer and Guy B. Panero is mechanical engineer for the project, both of New York. Walsh Construction Co., George A. Fuller, and Slattery Contracting Co., Inc., all of New York, are joint contractors. Contract requires completion by March 1, 1956.

Oklahoma toll study

The Oklahoma Turnpike Authority has engaged De Leuw, Cather & Co., Chicago, to make cost estimates on three proposed toll road projects (ENR Feb. 4, p. 22). The 310 mi of new highway will provide extensions of the Oklahoma City-Tulsa (Turner) Turnpike to the borders of Missouri, Kansas and Texas. Surveys are to begin April 1 and be completed in four months.

Kansas toll road

Report from consultants is favorable to 234-mi, $140-million turnpike

It is possible that work may begin in late fall on a $140-million, 234-mi Kansas toll road running from Kansas City southwest to the Oklahoma border with interchanges at Bonner Springs, Topeka, Emporia, El Dorado, Wichita and Wellington.

The Kansas Turnpike Authority last week got favorable reports on the project from representatives of Coverdale & Colpitts and Howard, Needles, Tammen & Bergendoff. As a result, detailed engineering studies have been ordered. Also, decision was made to offer a prospectus to bankers for financing the project.

Consulting engineers reported that the proposed bond issue could be retired in 19 years, instead of over a 40-year period as the turnpike authority had expected. Thus, potential traffic estimates were particularly encouraging.

Cost of the Kansas turnpike, according to the consulting engineers, will run about 35% more per mile than the Turner Turnpike in neighboring Oklahoma and about 50% higher than Colorado's Denver-Boulder turnpike. Higher construction costs and right-of-way expenses would both be factors in the higher cost estimate. But, the Kansas estimates include all features of expense, such as toll stations, policing, bonds and legal costs.

It was estimated that 7,500,000 vehicles would use the turnpike in the first year, netting tolls of more than $8 million. The turnpike authority would receive an additional $400,000 through the lease of concessions for service stations and restaurants.

At the Oklahoma border, the turnpike would link up with one of three proposed new toll roads to be built in that state (ENR Feb. 4, p. 22).

Ohio and Wisconsin surveys

J. E. Greiner Co. of Baltimore will make the preliminary engineering study and Coverdale & Colpitts of New York, a traffic and earnings study, of the Cincinnati-Conneaut route—main stem of Ohio's proposed Turnpike No. 2 system (ENR March 4, p. 21). Both surveys are to be completed in 160 days.

In Wisconsin, the same firms will be making preliminary surveys of the proposed Minneapolis-Chicago turnpike. Greiner was named last week, while Coverdale & Colpitts was selected earlier (ENR Feb. 25, p. 24).

AREA PRESIDENT: G. W. Miller.

Railway engineers

Chicago meeting hears of atom power for railroads

An expert in the field of nuclear power presented a thought-provoking discussion on the economic and motive-power effect of the atom last week in Chicago at the 53rd annual meeting of the American Railway Engineering Assn.

The largest effect of nuclear power developments on the economics of the railroad industry—as outlined in detail by John R. Menke, president of Nuclear Development Associates, Inc., probably will be on freight revenues.

Should our entire power complex some day operate on uranium, he said, the railroads face the loss of 75% of their bituminous coal freight revenue.

Mr. Menke made these predictions as to construction of nuclear-power steam plants: Only experimental or trial units up to 1965; perhaps 10% to 20% of new construction will be nuclear between 1965 and 1975; possibly 50% during 1975-85; and maybe 85% of new plant construction will be nuclear-powered following 1985.

As to the development of locomotive power from nuclear materials, Menke declared that stationary plants for producing electric power and small units for driving locomotives are both technically feasible.

Stationary plants operating electrified lines, however, seem more nearly in hand, technically. But there is little chance for years to come of producing electricity from such plants at costs much below conventional power stations with low-priced coal.

- **College graduates**—In his presidential address, C. G. Grove, chief engineer, western region, Pennsylvania Railroad, declared that colleges and universities are providing proper courses of study for railroad engineers, but the railroads are not getting their fair proportion of graduates—compared with other industries. The chief reason: Industry is offering better salaries.

- **New chief**—G. W. Miller, engineer maintenance-of-way of the eastern region of the Canadian Pacific Ry., was elected president of the American Railway Engineering Assn., at the association's annual meeting in Chicago, March 16-18. He succeeds C. G. Grove, chief engineer of western region of the Pennsylvania R.R. Mr. Miller is a native of Burlington, Wash., and a graduate of the University of British Columbia. He has been with CPR since graduation.

Job highlights

SKYSCRAPER—Design and construction contracts for a $3-million 25-story office building, three stores and a three-deck open garage in Oakland, Calif., have been awarded to John J. Moore, Oakland, by the MacArthur Properties, Inc., Oakland, Calif.

SANITARIUM—Medical College of Virginia, Richmond, has awarded the construction contract for a $3.7-million tuberculosis sanitarium and St. Philip Hospital addition to Doyle & Russell, Richmond. Baskerville & Sons, Richmond, are architects.

HOSPITAL—A $2.3-million construction contract to build a hospital at San Antonio, Tex. for the Texas State Hospitals & Special Schools, Austin, has been awarded to J. J. Fritch Construction Co., Dallas.

DRILLING PLATFORM—Joint contracts for the design and construction of an offshore platform for oil drilling operations in 250 ft of water have been awarded to Stone and Webster Engineering Corp., Boston, Mass., and Macco Corp., Los Angeles, Calif., by the Continental, Shell, Superior and Union Oil Companies in a four-way exploration project. Cost has not been determined, and the success of the experiment will mark a major increase in offshore drilling depths which have been limited to about 65 ft.

CORRECTION—The $35-million shopping center at Hempstead, New York, (ENR March 11, p 26) will be designed overall and built by Webb & Knapp, Inc., New York. Skidmore, Okings & Merrill, New York, are architects for the Macy store in the project.

See also Construction Reports page 64.

California freeway

Mile-long section has 14 grade separations

A mile-long section of Los Angeles Harbor Freeway was open to traffic March 23. Costing more than $6 million to build, it takes high-speed traffic past the congested downtown center.

The new section is notable for its multiplicity of bridges, undercrossings and elevated ramps. Some 14 such structures—mostly concrete box girders—were built under six contracts at a cost of nearly $4 million. They are required to take major streets over or under the freeway and provide access and exit ramps. Normal design practice does not call for so many structures. But the congested nature of the area required it in this instance.

The roadway was built under a $2-million contract by J. E. Haddock, Ltd. Basically it is an eight-lane divided highway capable of carrying in excess of 100,000 vehicles a day. Entry and exit ramps with lengthy acceleration and deceleration lanes make it 12 lanes wide in most sections. Design and construction supervision is by the California Division of Highways.

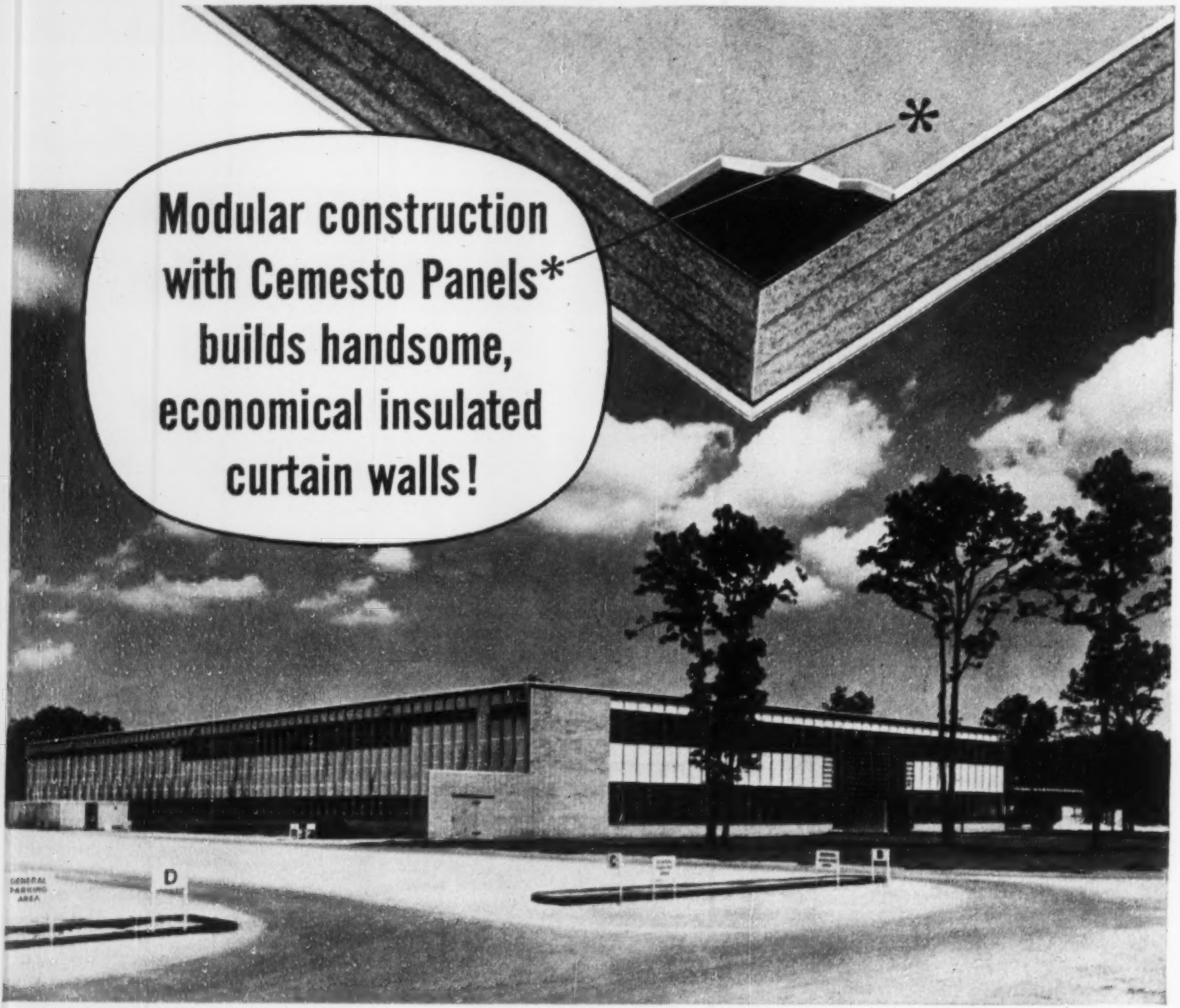
Ultimately, the Harbor Freeway will extend a total of 23 mi to San Pedro and the Los Angeles Harbor area, providing a bypass for the central area of Los Angeles. However, at present the primary function of the 1.5-mi-long completed section is to provide collection and dispersal facilities for traffic from four other freeways that connect with it. A total of 50 mi of interconnected freeways has been completed in the primary net.

Another mile of Harbor Freeway will be completed this fall, taking traffic to 23rd St. It is being built under a $1.8-million contract by Oberg Bros. Construction Co. And $3.7 million has been budgeted for almost two miles more to be bid this spring that will carry the route along as far as 42nd St.

Total right-of-way cost expended to date for the Harbor Freeway is $31 million.

New Orleans span ok'd

A new Mississippi River bridge at New Orleans has been approved by Army Engineers (ENR Feb. 11, p. 26). An early start on construction of the $55-million span is seen by the Mississippi River Bridge Authority, and the boring contract has been let to Greer and McClelland, New Orleans. Capt. Neville Levy, authority chairman, said that the bridge might be completed by January 1958, and that construction could start by this June.


Modular construction with Cemesto Panels* builds handsome, economical insulated curtain walls!
*
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GENERAL PARKING AREA

Stratos Division Plant of Fairchild Engine & Airplane Corp. at Bay Shore, L. I., N. Y., shows its handsome Cemesto Panelized exterior. Here is a unique combination of striking modular design plus functional use of panel materials.

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LABOR

NLRB reshaping Taft-Hartley

While Congress fights an apparent stand-off over the Taft-Hartley Act, the National Labor Relations Board is taking matters in its own hands—making new interpretations of the law that mean just as much as legislative changes that are now being fought on Capitol Hill.

As of the moment, Senate and House labor experts are pulling in opposite directions in their efforts to re-write Taft-Hartley.

- The Senate Labor Committee—guided by New York's Sen. Irving M. Ives—is following the lead of President Eisenhower who wants middle-of-the-road amendments, with some of them easing the present restrictions on labor unions.
- The House education and labor group, in turn, is voting tighter clamps on union activity. (For instance, the members want to abolish the NLRB and substitute federal courts to rule on unfair labor practices. This provision is aimed mainly at the old Truman board for its T-H interpretations, which management constantly criticized as pro-labor.)

But abolishment of the NLRB—or any other amendments—are considered unlikely in view of the tug-of-war between the two sides of Congress. And in the meantime the board, unmindful of the attempt to put it out of business, is making some important moves.

Here are two key developments:

- **The secondary boycott**—The agency, operating for the first time with a Republican majority, began a review of the secondary boycott section of the act—with the probable result being a clamp-down on one of the loopholes that has been protested by employers for a long time.

With newest member Albert C. Beeson taking part in his first case, the board took on for review a test of the five-year-old "Conway Doctrine." This doctrine, laid down by the Democrat-manned agency, gave an okay to union-employer contracts even though they apparently permitted secondary boycott activities specifically banned by Taft-Hartley. (The law says that unions may not take concerted economic action against an employer with whom they have no dispute in an attempt to get him to pressure the firm involved in the dispute, so he will settle with the union.)

The "hot cargo" contract clause is a favorite of the powerful AFL teamsters. The teamsters have thousands of contracts spelling out that their members will not be required to handle "unfair goods"—even if the goods are produced by a secondary employer.

In the case being reviewed by the board, teamster members working for three large trucking firms declined to handle goods carried shorthaul by a small Nebraska trucker—the McAllister Trucking Co.—though these companies previously had dealt with McAllister. The reason for the refusal: McAllister declined to negotiate a contract with the teamsters when the union failed to sign up a majority of its workers. Teamster officials promptly labeled the goods "unfair."

Under the present policy, this is considered a legal practice because the workers were covered by a contract permitting such activity. But with the board now manned by a three-to-two GOP majority, McAllister asked for a review of the old decision and a reversal.

At an open hearing last week, McAllister's attorneys argued that contracts could not be written to supersede the law; to permit practices specifically banned by the law. Union lawyers countered that it was not up to the board to make any change in interpretation, that teamster contracts were negotiated under the old board policy and to change it now would be disruptive to labor relations. Besides, they said, if any change is to be made it should be done by amendment in Congress, not by the NLRB.

But the betting is that the NLRB will clamp down on this activity, long before Congress gets around to restricting such practices.

- **Jurisdiction rules due**—The second development is in the offing. Led by NLRB Chairman Guy Farmer, the agency will shortly set a new policy restricting its jurisdiction over labor-management disputes.

Since taking office last summer, Farmer has protested that too many cases reach the federal board—cases that aren't big or important enough to end up in Washington. He claims the old board took jurisdiction over many labor-management disputes that had little or no effect on interstate commerce, the guidepost for federal action.

Now he and his colleagues are about ready to move. They will lay down a firm set of regulations, indicating what size and type of cases they will handle, leaving the remainder to the states for the state labor agencies to act on. The net result will restrict sharply the number of disputes ending up at the board and will permit it to act more promptly on those it does get. (It requires an average of 200 days to process an unfair labor practice case following present procedures.)

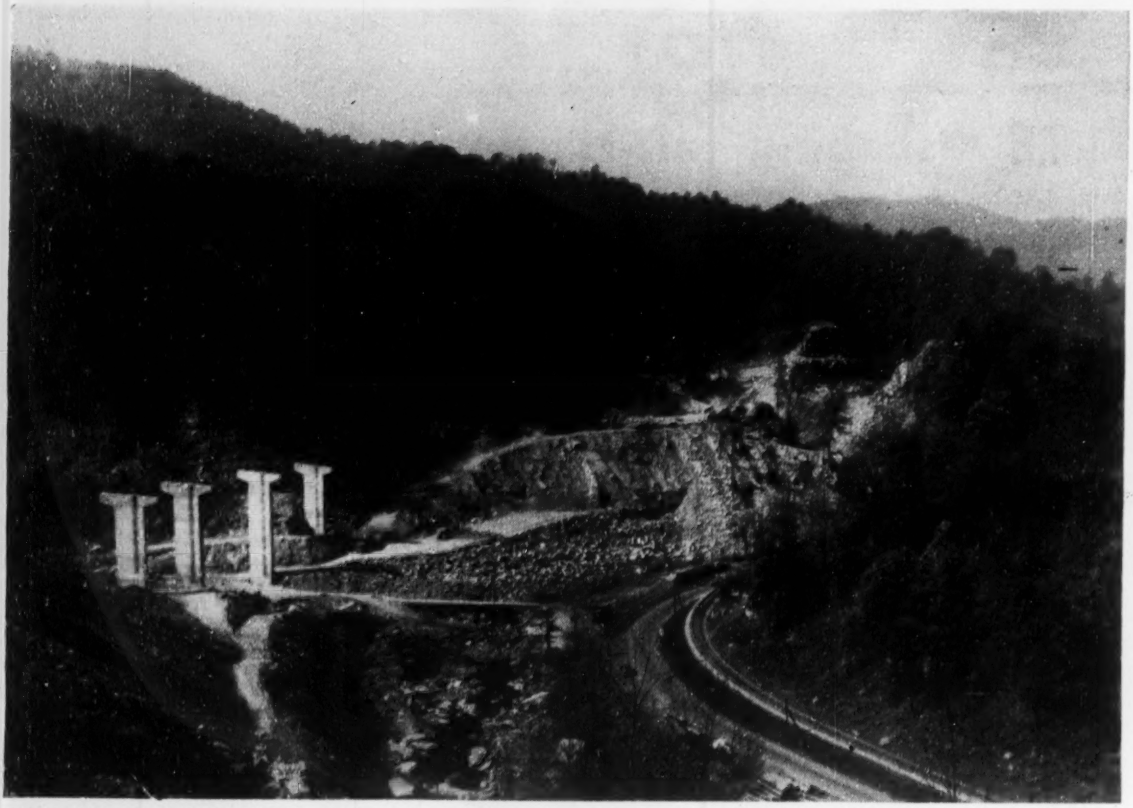
This move will fit in well with the Eisenhower Administration's proclaimed desire to have labor-management disputes settled—as much as possible—in the area where they develop.

Labor briefs . . .

- **Area talks on**—Negotiations for contract changes have begun between the Central and Northern California chapters of the Associated General Contractors and five construction unions, representing AFL cement masons, teamsters, operating engineers, and laborers in 46 counties and carpenters in 42 counties. Contracts with the five unions expire near the end of April. Carpenters in four Bay area counties—San Francisco, Marin, Alameda and San Mateo—are covered in a contract which does not expire until June.

- **Advice now available**—Denver AFL unions have established a permanent committee on unemployment and welfare. Patterned after a similar labor group in Detroit, the committee will offer legal and advisory services free to union and non-union workers. One objective will be to see that workers who have been laid off receive unemployment compensation. The committee plans meetings throughout Colorado with employer groups to "propose that private enterprise try to stimulate business instead of cutting back payrolls."

- **Western wages rise**—Some 7,000 AFL carpenters in eastern Washington and northern Idaho have ended a 42-day strike after winning an immediate wage increase of five cents an hour from building contractors—plus an additional 10-cent hourly boost in July. The union is still negotiating with heavy and highway contractors of the local AGC chapter. In the same area, 10,000 cement masons received a 7-cent hourly raise. And Seattle sheet metal workers called off a 50-day strike when they got a 20½-cent hourly boost.



BACKBREAKING ROADWORK—Where rails and old roads snake alongside creeks, West Virginia Turnpike breaks through the backbones of ridges, rides high across valleys. Bridge at left is one of five in a mile-and-a-half stretch.

Mountain turnpike goes into home stretch

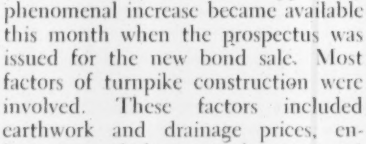
Analysis shows how cost increased 50% over original estimate in two years

West Virginia's rugged terrain, which has discouraged through traffic since the days of the westing pioneer, at last is submitting to the art of the superhighway builder—with an essential assist from financiers.

Conqueror of the state's ridges and valleys is the West Virginia Turnpike, to be opened in August. Originally planned as a dual highway from Wheeling to Princeton, via state-capital Charleston, the project was pared by feasibility studies to a two-lane 88-mile route between Charleston and Princeton, the toughest country, hence the area of least adequate free roads. The cost was to be $96 million, and a bond issue in that amount was sold in the spring of 1952. Since then traffic forecasts have jumped sharply and proposed toll rates have been inched upward, together justifying a greater expenditure.

This justification is fortunate, because costs have outstripped the estimates on which the first bond issue was based. A $37-million issue, sold this month, brings the total to $133 million. About $92 million is construction-contract cost, an increase of $32 million over the first bond-issue estimate.

A full analysis of this apparently phenomenal increase became available this month when the prospectus was issued for the new bond sale. Most factors of turnpike construction were involved. These factors included earthwork and drainage prices, enlargement of the project's scope and an only partly foreseen construction condition—bad slides in earth cuts. An administrative decision to pave with portland-cement concrete instead of asphalt added another $4 million to the construction-contract bill.



TURNPIKE IS 88 miles long, replacing 107 miles of steep grades and sharp turns.

Project cost was estimated at the beginning of 1952, on the basis of location studies that included earthwork quantities taken off U.S.G.S. maps having 50-ft contours and a scale of one mile to the inch, supplemented by a stadia survey.

Excavation was let on an unclassified basis only. The estimated cost was $0.65 a cu yd, and the first grading contract was let in August. The excavation price in this contract was $0.68, with an extra $0.22 per cu yd for fill compaction. The estimated 65-cent unit price was 20% higher than current West Virginia earthwork costs, an increase that engineers considered sufficient to cover the project's unusually deep cuts.

- **Delay proves costly**—Then a lawsuit was brought challenging the turnpike commission's right to build a two-lane road when the enabling legislation described a dual highway.

This suit stopped further grading contract awards for five months. The turnpike commission was vindicated

SIDESLOPE SLIDES have marred many a turnpike cut. Excavation disturbed the delicate equilibrium of talus slopes, setting up slide conditions. Removal—in many cases down to baserock—has added 3,500,000 cu yd to project excavation total.

on the ground that it could use "stage" construction for eventual realization of the dual-road objective; but valuable time was lost.

At the moment the principal loss seemed to be three months of good fall construction weather. However, when the grading bids began to come in in January, it was apparent that a price advantage had been lost, too. The final overall average price was $1.30 a yard, making the cost of the originally estimated 21,500,000 cu yd $28 million instead of $14 million. The project's general consultants, Howard, Needles, Tammen and Bergendoff, of New York, attribute the yardage price increase largely to a poor contract-award schedule which was imposed by the court delay.

The awards took place, the consultants state, at a time when there was "severe competition from other major projects . . . notably the New York Thruway, the Ohio Turnpike and a Pennsylvania Turnpike extension. . . . As a result, contractors were not hungry for the work. They named unit prices . . . which were in several instances greatly in excess of estimated prices and prices in previous experience in the area. It was necessary to pay these increased costs to secure completion of the Turnpike within a reasonable time."

Pressure to get the project to a revenue-producing status in 1954, as originally scheduled, imposed shorter contract time on the contractors, with the attendant need for a higher investment in equipment and overtime.

• **Project enlarged**—And then there was a substantial increase over the original earthwork quantity estimate. Some of this was an under-run in the quantity take-off from maps, but the bulk of it was due to the scope change and slides. Grading contract quantities totaled 27,900,000 cu yd; slides have added 3,500,00 cu yd. Most of the scope changes were tied in with the project's ultimate dualization. Where cut-widening would be expensive later, because of insufficient work space alongside traffic, the full-width cut was made. At these locations the additional cut width was less than 10 ft. the minimum work space for a power shovel.

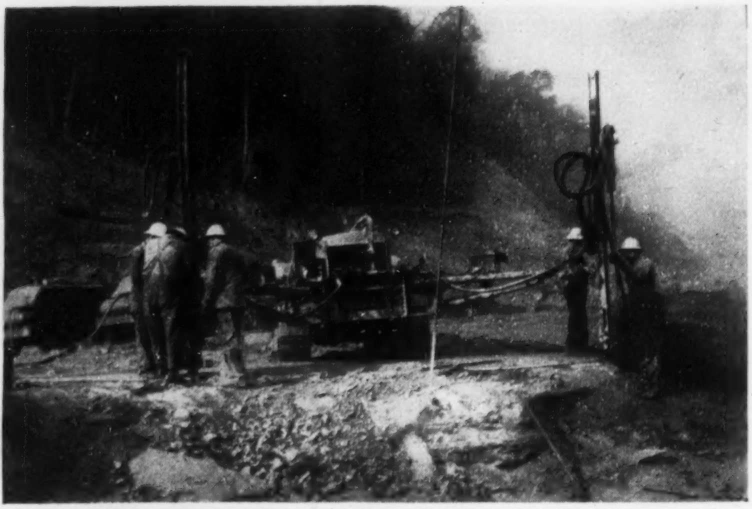
Because two-lane fills under-ran the cuts on most of the work, much of the material that would have been wasted was used for full-width fills; this entailed some over-haul. The magnitude of this extra earthwork is indicated by the fact that dualization will require a separate two-lane roadway; the original strip will become one-directional. Dualization earthwork is being substantially completed on 30 miles of the turnpike's 88-mile length. Also there was a decision to complete dualization grading at interchange and service areas.

Other scope changes included an increase in the steeper-grade mileage to be served by third lanes for trucks. These creeper lanes originally were scheduled for 14 miles, but there will be 25 miles of them in the current project. Further extra grading stems from horizontal sight-distance improvements, reduction of curvature, elimination of 10 bridges, an alinement change to allow the dual highway to pass through a narrow valley.

• **Slides in contingency figures**—Altogether, the grading and drainage for the present project will cost $43 million—about $27 million more than the original estimate. Some of this difference could be said to come out of a $10-million contingency item that was in the original estimate, but over-and-above the construction cost estimate. Indeed, the engineers had anticipated about a million yards of slide-correction excavation as a part of the contingency item. Cut slopes had been designed as steep as was thought possible in order to keep excavation to a minimum; it was anticipated that some would be too steep.

But the slide-correction contingency

ROCK DRILLING called all kinds of equipment into play. Big portable roller-bit rig at left dwarfs wagon drill at right.



HIGH MANEUVERABILITY is a feature of this drilling rig. Power booms on front of tractor spot drifters quickly. Compressor with 575-cu ft capacity is on rear, driven by tractor engine. Note coal dust coming from drill at right.

proved entirely inadequate. This emphasizes the need for funds and time to make subsurface exploration before a cost estimate is required. In some sections of the turnpike almost every earth cut has been enlarged in order to keep slides from choking the roadway. And many of the cuts were big ones already—as deep as 175 ft through bridges and 320 ft on side slopes.

Such heavy earthwork was a necessary consequence of laying comparatively easy grades through West Virginia. But the easy grades are mostly constructed now. Ahead lies five months of paving—the project's home stretch.

• **Early studies**—The general consultant was engaged in May, 1950, about three years after the West Virginia legislature had passed the turnpike's enabling law. Starting with available topographic maps and old aerial photos, as well as some traffic data, the consultant soon determined a route that might support a turnpike project. This was between Princeton and a point 30 miles north of Charleston. Locations then were selected on the topo maps, and inspected in the field. Meanwhile, in the latter part of 1951, the New York firm of Coverdale and Colpitts was making a traffic study. Analysis of cost estimates and the traffic study led to choice of the 88-mile Charleston-Princeton project length and the two-lane roadway. In anticipation of detail design work, an $80,000-contract was awarded for a photo-map of a mile-wide strip along the best location. A few of this contract's 5-ft contour sheets became available in time for spot-checking quantity estimates.

• **Bonds hinge on steel**—Before revenue bonds could be sold, investment bankers required firm bids on the project's bridge steel. This condition arose from the unsettled nature of the steel market in those Korean war days. The general consultants surveyed all bridge sites, designed the bridges and obtained steel bids from Bethlehem Steel Co. and the American Bridge Co. Bonds were sold in April, 1952, whereupon bridge contracts were let. Each company got about half of the fabrication, and American Bridge got all erection.

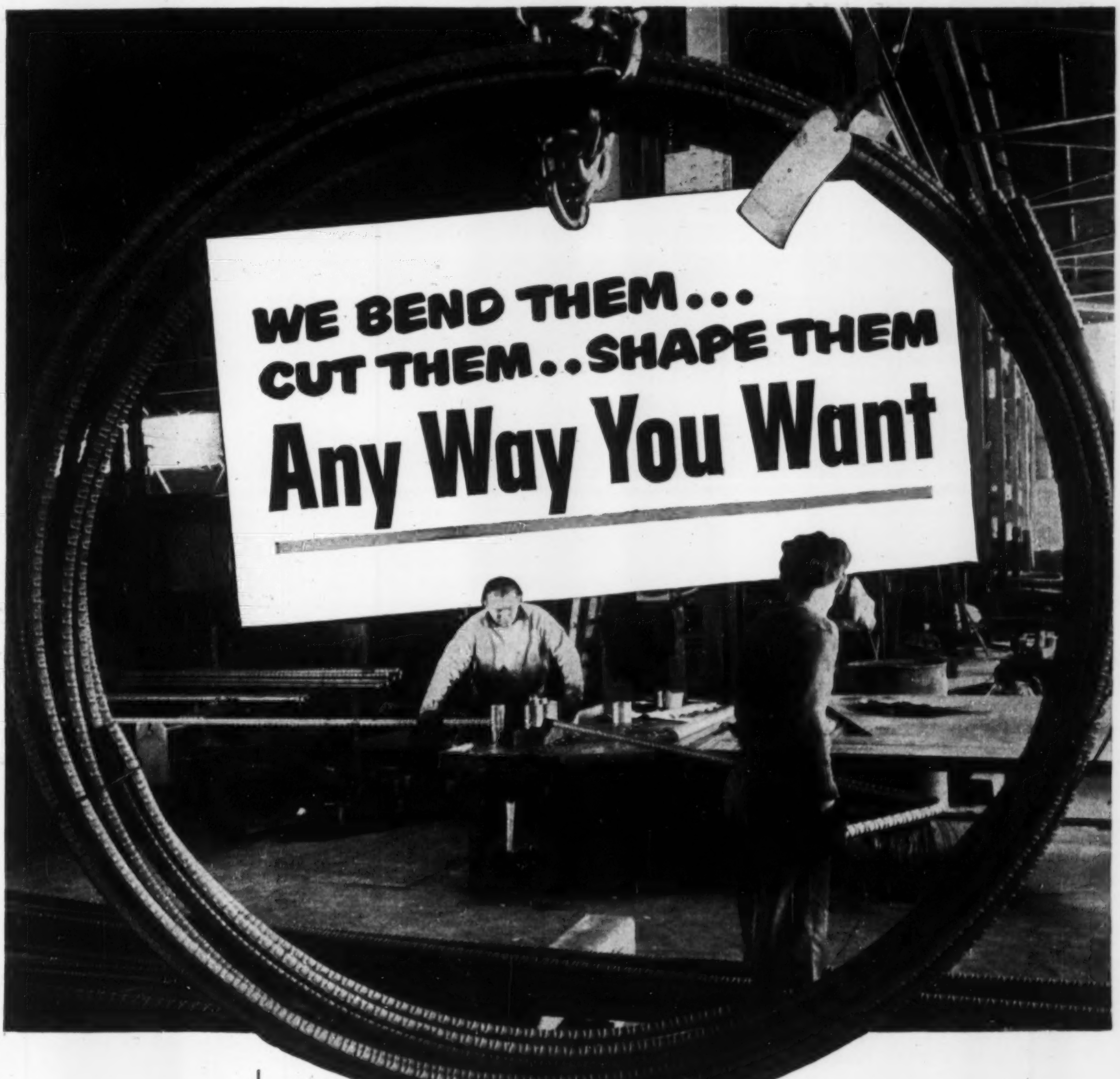
Roadway design contracts were negotiated with: Capitol Engineering Co., Dillsburg, Pa. (20 mi., field supervision to be by Fay, Spofford and Thorndike, Boston); Fay Spofford, and Thorndike (30 mi, also field supervision); Gannett, Fleming, Corddry & Carpenter, Harrisburg, Pa., (38 mi., also field supervision). Singstad and Baillie, New York, were engaged to design the tunnel. The tunnel and three major bridges have been supervised by the general consultant.

Roadways were designed for 60-mph travel, with 1,000-ft radius curves and minimum 600 ft sight distance. For the most part grades are 3% or less, as on the mountainous section of the Pennsylvania Turnpike, but some go up to 5%. Where grades will slow heavy trucks, the creeper lanes are being built. These lanes overlap at summits because the trucks need additional roadway on which to accelerate before swinging back into the main stream.

• **Million yards a week**—With such extensive ironing-out of West Virginia's terrain, the most obvious feature of the project has been its heavy earthwork. At the height of excavation work last summer and fall contractors regularly dug a total of more than a million yards weekly for nearly 20 weeks. About $30 million worth of equipment was on the job at that time.

On an average, 60% of material taken from cuts was rock; on one contract the rock proportion was 90%. With such high yardages of rock to be excavated, the accent was on big equipment wherever possible. Wagon drills and even jack hammers were used to get toe-holds on cuts (there was an unconfirmed rumor that pack mules took drills and dynamite to one site), but several contractors put large 6-in. roller-bit drills on their jobs as soon as enough rock had been exposed to make them pay. Furthermore, on one job where high maneuverability was required the contractor used a special adaptation of a large crawler tractor. On the front were two hydraulic booms of a type normally used on tunnel drill carriages. These carried drifters. The compressor, a 575-cfm model, was mounted on the rear of the tractor, getting its power from the tractor engine.

• **Careful rockfill**—The high percentage of rock excavation has made necessary some exacting work in fill-building—particularly because paving is to go on fills so soon after their construction. Believing that rockfill should be placed in layers of minimum practicable thickness in order to obtain good consolidation, engineers specified rock layers no thicker than 24 in., to be placed a full-length and width of fill at a time. No rock was dumped directly at its final resting place. Rather it was bulldozed to proper position and thickness, assur-



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Slides plague West Virginia Turnpike

ing better distribution and "packing" action under rollers.

Important among the tools on a rockfill was the headache ball, handled by a crane. All rocks too big to fit in a 24-in. layer were broken by blows from the ball, which in most cases weighed 2 or 3 tons.

Naturally there was a tendency by the contractors to increase the layer thickness, because the fill possibly could be built up more rapidly that way. But inspectors were particularly careful on the point, in cases of such fudging requiring the contractor to rip out the over-thick layer and replace it, rather than allowing him to feather-down to the 24-in. thickness. Project engineers note that for the most part the turnpike contractors respect such rigid inspection. Where earth was available, the top 3 ft of rock fills was laid by earthfill specifications. At some places it was necessary to reduce the minimum to 1 ft.

Earthfill construction was conventional, the material being deposited in loose 8-in. layers and compacted. Again, however, there was close inspection to enforce specifications that might not be necessary on jobs with more time for gravity and moisture to achieve consolidation. Moisture content was controlled and the amount of equipment specified (one approved compactor—sheepsfoot or pneumatic-tired—per 200 cu yd of hourly fill placement; or one 50-ton super-compactor per 400 cu yd hourly). Rolling continued until the fill stopped moving under roller action. As a further precaution the specifications excluded the action of wheeled vehicles as a consideration in compaction, uniformity being almost impossible to achieve by this means.

• Fills stand up—Periodic profile observations on turnpike fills during the winter have shown minor settlement—less than a tenth of a foot—at nearly all sites. Six fills have settled about three tenths. Apparently these are coming to rest. In all cases subsidence is general throughout fill length, indicating uniform placement conditions. A high number of freezing and thawing cycles (60 by March 1) coupled with frequent light precipitation have given the fills a good test during the winter, in the opinion of the general consultants. Individual fills are up to 100 ft. high and contain as much as 1,000,000 cu yd.

• Firm bridge approaches—Special attention has been given to compaction at bridge approaches. On other turnpikes and highway jobs subgrades at these points have settled after construction, resulting in an uncomfortable thank-you-ma'am effect on motorists. An important reason for this settlement is the difficulty of achieving proper compaction in restricted areas around wing walls.

On the West Virginia Turnpike engineers have used a comparative test, rather than a quantitative test, for compaction at approaches. Plate bearing tests were made on each fill at points 5 ft, 50 ft, 100 ft and 200 ft from the abutment. The plate was 6 in. square; a jack under a road-rolling machine applied the plate loading. If the results of the plate-bearing test were the same at all four locations the approach fill was considered adequately compacted. As an added measure to assure smooth approaches, the concrete roadway slab is to be reinforced for a distance of at least 150 ft from the abutment.

Almost all of the fill material came from roadway cuts, borrow being used in a few locations where haul would be too expensive. In most sections of the project substantial yardage had to be wasted or used for dualization fills. Slides increased this extra quantity.

As has been mentioned, slopes were designed close to their estimated limits of stability, in order to keep earthwork costs down. Four categories were assigned, varying from 4 on 1 for firm rock to 2 on 3 for earth. Furthermore, rock slopes were benched, the benches being wide enough to accommodate maintenance equipment for loose-rock removal.

• Why does it slide? The loose and decomposed rock categories, as well as most of the straight earth, are talus slopes—the products of base-rock weathering, lying at or near their natural angle of repose. (The mountains have been carved by erosion and there is practically no topsoil in West Virginia.) Any disturbance of the balance, such as that set up by a highway cut, invites a slide. A further factor frequently seems to be a thin film or deposit of clay on the underlying rock slope. Under normal West Virginia groundwater conditions this deposit is saturated, and where present it acts like a grease when sliding takes place.

Slides began in many side-hill cuts soon after they were made. Soils experts made borings and for some locations suggested, without much hope, inexpensive solutions like horizontal bored drains to dry out the talus and increase its shear value. The short-cut approaches were tried with limited success, but generally it was necessary to remove the major force that was causing the slides—earth at the top of the slope. This earth previously had been supported by the material that was excavated.

In extreme cases, the talus equilibrium had been so delicate that it was necessary to strip the slopes down to the bare rock. One slide required 400,000 cu yd of excavation; on another contract 1,000,000 cu yd was removed in a 2-mile stretch of turnpike location.

However, there were practically no instances of sliding on side-hill fills. Where the natural slope of the earth under these fills was greater than one on three, the slope was benched to present horizontal surfaces for fill bearing.

There are 19 grading contracts, ranging in length from 0.6 mi to 9.7 mi. Estimated yardages run from 232,000 to 3,260,000, with contract estimated totals from $392,000 to $6,184,000. These contracts include drainage structures and substructures for the project's 73 minor bridges. Grading has been carried to an elevation 2 ft below planned top of paving.

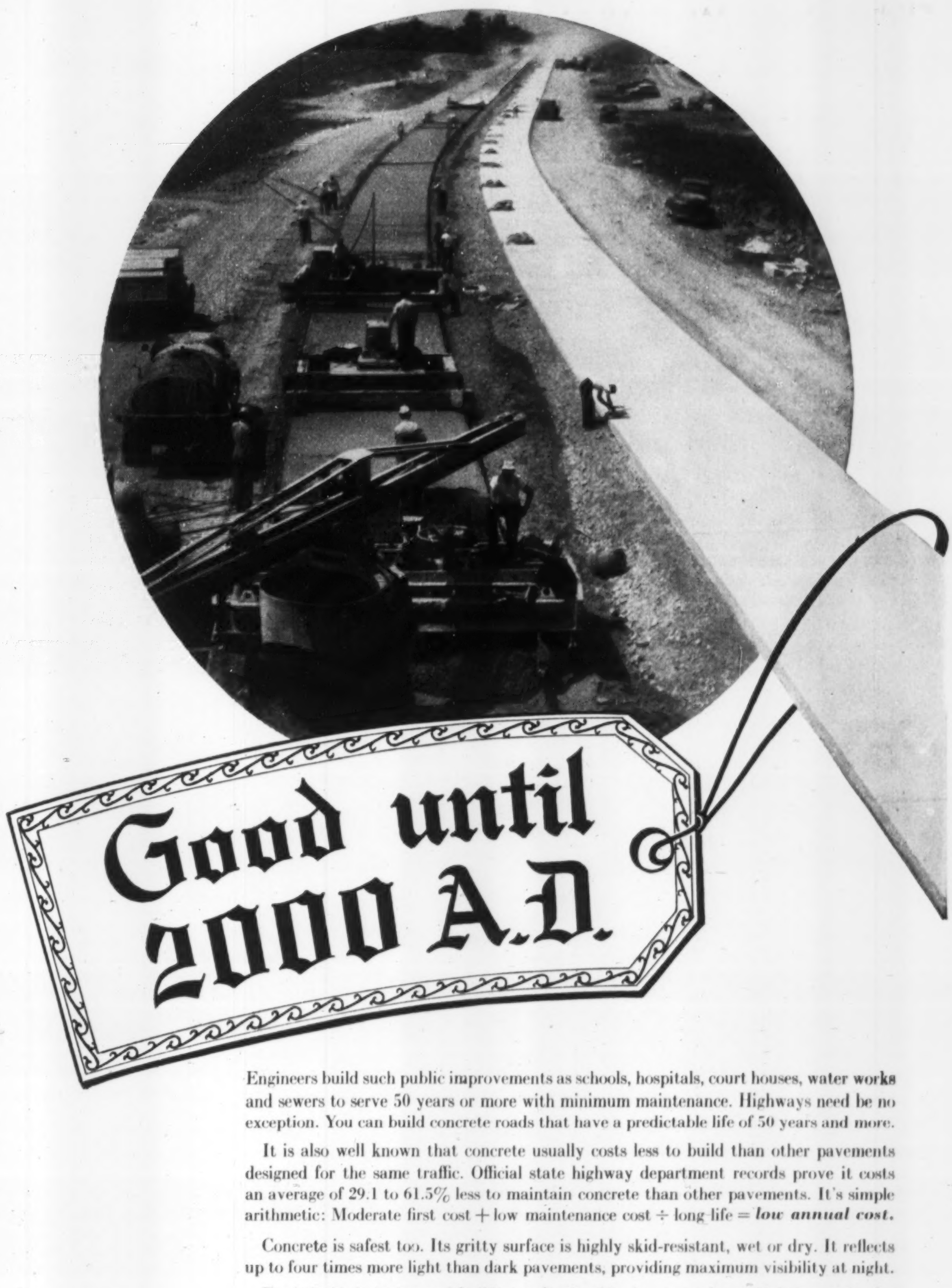
• Slope protection—Grading contracts, except in special instances, did not include topsoiling on earth slopes outside of areas to be surfaced, because of West Virginia's scarcity of topsoil. Instead, a small crew of West Virginia Turnpike maintenance employees has been applying fertilizer, seed and mulch to the raw earth as finished slopes become available.

Crew size varies from 5 to 10 men. Equipment includes a tank truck with spray, for applying fertilizer and seed, and another truck towing a flossing machine. This machine chops straw into short pieces and blows it onto the slopes. Most of the straw sticks into the ground, reducing its tendency to erode while the seeds take root. Straw bales are carried in the towing truck. The whole operation costs about $300 an acre, and the crew can cover a half mile of regular roadway section in a day. The general consultant tells the crew where work areas are available.

The seeding crew began its work last fall as soon as significant areas of finished slope became available. Work was interrupted by bad weather for two winter months, and now is back in full production.

Grading also has been resumed, about 4,000,000 cu yd having been uncompleted when the winter shutdown began. This quantity broke down to 500,000 cu yd unfinished in the lower 50 miles and 3,500,000 cu yd in the upper 38.

(*Continued on page 36*)



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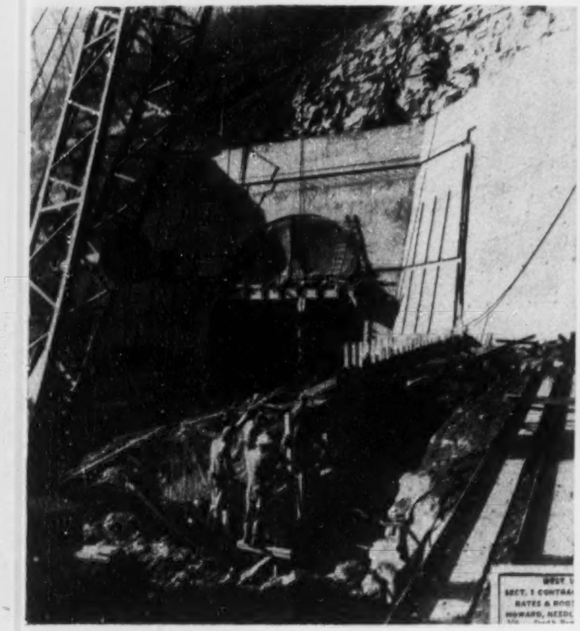
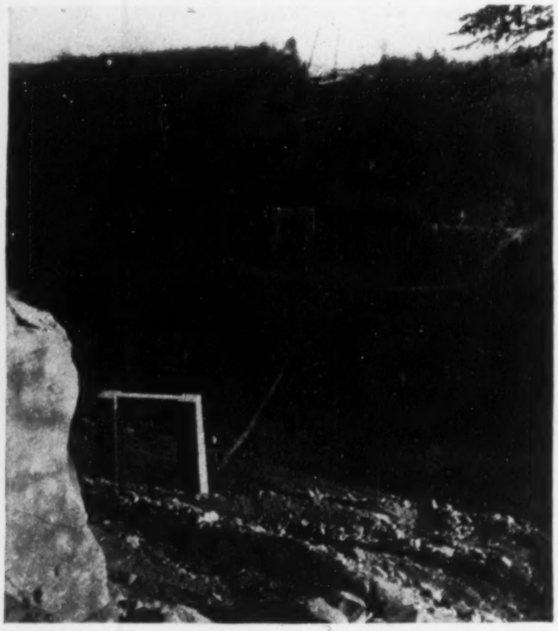


MEMORIAL TUNNEL is 20 miles from Charleston end of turnpike. A half mile long, it will be fully ventilated. Note form for roadway ceiling, which will be floor of ventilation duct.



MAJOR BRIDGES are at three sites: Bluestone River, near southern end of turnpike (above); Four Mile Fork, adjacent to the tunnel; and Kanawha River, near Charleston.

• **Fast paving schedule**—The engineers say that earthwork completion will not interfere with the paving contract schedule, which requires full execution between April 1 and August 1. Calling for 1,600,000 sq yd of concrete, the contracts were awarded last October. Since then four contractors have been quarrying and preparing crusher-run sandstone to be used as select sub-base and organizing their concrete operations. Crushers at six sites are producing 35,000 tons of select sub-base daily. A small amount of sub-base was laid last fall, and since then stockpiles have been growing.

Select sub-base thickness will be 14 in., topped by a 1-in. sand cushion and a 9-in. plain concrete slab 24 ft wide. The sand cushion will be carried 15 in. outside the slab edges, in order to provide a firm and accurately graded foundation for sideforms. Within the slab area the sand cushion facilitates precise operation by the subgrading machine.

The two-lane concrete slab is flanked by 9-ft strips of penetration macadam 3 in. thick, on 21 in. of select sub-base. This shoulder treatment is strong enough to carry moving heavy trucks in unusual or emergency situations. Where the roadway includes a 12-ft creeper lane the macadam shoulder treatment is only 2 ft wide. In both cases the sub-base is carried outward under the surfacing and feathered down in a width of about 6 ft.

According to the general consultants, the sub-base thickness hinged on the need, in West Virginia, to have frost-free materials to a depth of 24 in. below the highway surface. Thickness was not dictated by foundation-strength requirements for support of the concrete slab. This statement was made in answer to critics who considered the concrete cross-section to be over-designed.

Paving contracts—four in all—add up to \$19.5 million. This is about \$4 million higher than the amount bid for asphalt. Not much of the difference can be assigned to the sub-bases because they are practically the same in both designs. The asphalt sub-base design calls for 15 in. of selected material. The big difference, lies in the top 9 in., which in the asphalt design is 6 in. of penetration macadam and two 1½-in courses of hotmix. The consultants prepared this design as comparable in quality to their concrete design, giving due consideration to the crusher-run sandstone sub-base in each case.

• **Why concrete costs more**—A crushed limestone, suitable for the asphalt, is available more or less locally along the West Virginia Turnpike. This stone also is suitable for coarse aggregate in the 9-in. concrete slab that will be built, but sand must be imported from points as distant as Richmond, Va. Cement-shipping costs also are part of the higher price.

Cost contrasts between the original estimate and the contract awards are greater than the concrete-asphalt difference, however. The original estimate for subgrade and paving was \$11.6 million. A significant part of the increase can be attributed to some of the project scope factors already mentioned, but beyond that is the fact that all sub-base materials must be crushed. During preliminary investigations, streambed gravel had been counted on for a lot of the sub-base.

Later this material was found to be marginal in quality and insufficient in quantity. Originally estimated at \$2.6 million, the sub-base will cost \$8.4 million.

• **Sawed joints**—Concrete pavement design features the use of sawed transverse grooves for shrinkage-crack control.

Except at bridge approaches, the West Virginia Turnpike slab contains no steel, so it is important to get the grooves sawed before crack-inducing stresses occur. As soon as the green concrete will stand sawing, the first cut is to be made at 72-ft intervals. Shrinkage stresses already in the concrete will be relieved by cracks that open at these grooves. The second pass of the cutting machine goes halfway between the first cuts, and a third is to be made in the middle of the 36-ft slab lengths, making the final cut (and crack) interval 18 ft.

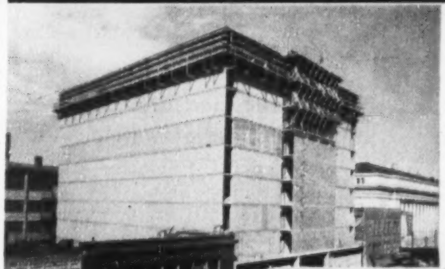
Because saw wear decreases as concrete gets harder there is economy in making cuts at the latest possible time. It is likely that the second cut

Concrete for Two Parking Buildings Pumped at ½ Original Estimate

Using a single 160 Pumpcrete, a wise contractor placed the concrete for two 11-story parking buildings—at a saving of ½ the original estimate for doing the job with towers and concrete buggies. The jobs were several blocks apart, but the readily portable Pumpcrete was easily shuttled between the two for alternate pours.

Located at basement level, Pumpcrete was readily accessible to truck mixers that delivered concrete to the site through the alley. Pipeline was run up floor by floor as fast as pouring progressed. Compare this simplicity with ramps, buggy runs, towers, and other cost-adding preparatory work.

Important too, on a job such as this where job area is congested, was the absence of interference among the various trades. Form setters, steel setters, masons, electricians, etc., could work on schedule without being hampered by pouring crews and buggy traffic.



ABOVE
One of two 11-story parking buildings. Pumpcrete—concrete by pipeline—saved ½ the placement cost over tower and buggy method.

AT RIGHT
Pumpcrete sits in basement—completely out of the way of all other job operations—and delivers concrete 10 stories straight up.

Close-up of pouring operation on eleventh floor. Note pipeline elbow at end of line which can be swiveled from one side to the other to gain maximum spouting range with one setup of pipeline.
BELOW

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IF YOU'RE INTERESTED in seeing other types of jobs on which Rex Pumpcrete has cut the cost of concrete placement, we will be happy to send you copies of "It was done with Pumpcrete." There may be helpful data you can use to c costs on your jobs. See your Rex Distributor, write Chain Belt Company, 4633 W. Gree field Ave., Milwaukee 1, Wis.

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Tunnel, bridges did not exceed estimate

will be made two or three days after the first, and the final one, being least critical, will be made about a week later. If the cut is made too late an uncontrolled crack will occur ahead of the cutting machine as it approaches the end of a pass. The time for initiating the first cut will be determined by test cuts on 2x2-ft slabs cast at the roadside and cured the same as the main slab. About 1,400,000 ft of groove is to be sawn, including a longitudinal joint in slabs placed in full 24-ft width.

The big push now is under way on the paving contracts. Sub-base placement is proceeding, drawing from the daily crusher run and a 750,000-ton stockpile that was built up during the winter. There will be just 100 working days available for slab placement, and in a stretch at the Charleston end a month less is available to complete this operation.

• Major bridges—The Charleston end of the turnpike, which runs along the Kanawha River, includes one of the turnpike's three major bridges. Two-lane (32 ft) Kanawha River Bridge is to be slightly under a half mile long, including a through tied-arch main span, continuous with adjacent side spans. Steel erection at this site is complete.

The other two major bridges, at Four Mile Fork and Bluestone River, also are fully erected. Both crossing ravines nearly 300 ft below deck level they are identical three-span continuous deck trusses with 504-ft main spans and 250-ft side spans. Like the Kanawha bridge they will carry two lanes (30 ft between curbs.) Minor bridges, of which there are 73, generally have continuous rolled-beam spans, resting on single-pedestal piers with T heads. Two-lane roadway width is 30 ft; three-lane, 36 ft.

• The tunnel—Despite the rugged terrain, there is only one tunnel on the West Virginia Turnpike. A half mile long, it is adjacent to Four Mile Fork Bridge. Its horse-shoe section is 30 ft. high and 33 ft wide, providing a two-lane roadway 24 ft between curbs and a ventilation duct that is divided for injection of fresh air and withdrawal of used air by ventilation buildings at each end. The duct will be an arch plenum, above a ceiling over the roadway. Mechanical equipment includes carbon dioxide detection devices automatically tied in with blower controls and traffic signals. The tunnel now is fully lined, and tile interior facing is under way. It will be lighted with continuous fluorescent tubes along each side.

• A silver lining—Bridges and the tunnel were two turnpike items that did not exceed original cost estimates. There was a slight saving on the tunnel, which is costing $4.6 million.

Other items costing less than estimated are miscellaneous drainage, slope protection, right-of-way fence, buildings, lighting, signs, communications and the service areas.

• Relocation costly—The turnpike commission was not so fortunate, however, in road relocations and land acquisition. The initial figure for road relocations was $430,000; it now is $2,935,000. This increase hinges largely on agreements that were made with the State Road Commission after the initial estimate had been made. In one case, where a series of short relocations had been contemplated, the agreement specified 3.5 miles of new road; this piece of work cost $1.5 million. Total length of relocations is 25 miles.

The land acquisition figure jumped from $4.5 million to $7.7 million, due partly to increased taking in anticipation of dualization. The rather nebulous question of mineral rights also was involved, inasmuch as West Virginia is a major coal-producing state. In all but one case the turnpike commission acquired mineral rights down to 100 ft below the construction, whether it be bottom of cut or bottom of fill. At the tunnel, mineral rights above the construction also were obtained.

The presence of old mine workings has been a minor irritant at some places along the location. Due to removal of mine supports, or to their decay, bad rock fractures were encountered in cuts. Some extra rock excavation was necessary, and the fractures were construction hazards.

• Management—Elmer K. Timby is the HNTB partner in charge of West Virginia Turnpike. Resident project engineer is Carl H. Peterson who manages a force of 50 in Charleston and 80 in the field. Section engineers are B. Hudgins and R. Hearnes. Fay, Spofford and Thorndike forces in the field number 80, and there are 50 in the Gannett, Fleming, Corddry & Carpenter Field force.

Spreading treated sewage produces safe ground water

Winding up one phase of its study of waste water reclamation, the Sanitary Engineering Research Project of the University of California has released results of a field investigation of underground recharge by spreading.

The research was conducted for the State Water Pollution Control Board on specially prepared test plots adjacent to the Lodi, Calif., sewage plant.

These are some of the conclusions:

(1) A bacteriologically safe water can be produced from settled sewage or from final effluent if the liquid passes through at least four feet of soil.

(2) A water of satisfactory chemical quality can be produced from settled sewage or final effluent, provided high concentrations of undesirable industrial wastes are not included in the raw sewage.

(3) A highly treated sewage plant effluent must be used for spreading in order to obtain high rates of percolation.

(4) A percolation rate of at least 0.5 acre ft per acre per day can be expected when spreading a final effluent on a Hanford fine sandy loam such as that found at the Lodi site.

Copies of the report—"Field Investigation of Waste Water Reclamation in Relation to Ground Water Pollution"—are available from the State Water Pollution Control Board, 721 Capitol Ave., Sacramento, Calif.

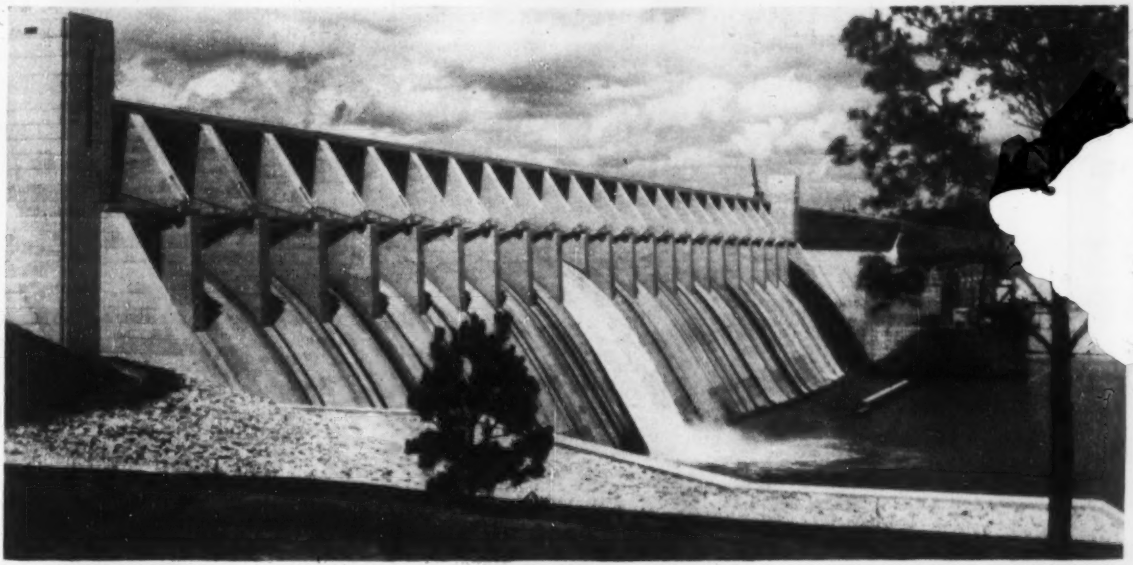
New meter measures flow in pressure relief wells

The Corps of Engineers' Waterways Experiment Station at Vicksburg, Miss., recently has developed an improved meter for measuring flow in pressure relief wells. These wells installed at the toe of earth dams and behind levees intercept seepage and provide relief for excessive hydrostatic pressures in permeable strata beneath the structures. Measurements of seepage flow into the wells from various strata as well as total flow are obtainable with the meter.

The flow meter—essentially a vertically operating current meter—is used to measure electrically the rate of revolution of an eight-blade aluminum impeller which is mounted inside a guard ring.

The device is provided with a spring-leaf adapter, adjustable to various wall diameters, which centers the meter in operating position. The unit is lowered into the well on a cable in order to measure flow at any desired depth.

The meter is calibrated in relief well pipes of appropriate diameters by counting rates of revolution for known flows through the pipe. Meters constructed for the St. Louis District and for use of Waterways Experiment Station field parties have been calibrated in 6- and 8-in. pipes and show linear operation accurate to better than 3 per cent of flow over a range of 10 to 1,000 gpm.



FLOW CONTROL can help or hinder pollution control. Clark Hill Dam helps on the Savannah River. Others can and do hinder.

Broader view is needed by river developers

C. J. Velz
University of Michigan
School of Public Health
Ann Arbor, Mich.

Professor Velz is a consultant to the pulp and paper industry's National Council for Stream Improvement. This article comes from his discussion before that group at its annual meeting in New York last month.

Limited water resources pose problems in our rapidly expanding industrial society. With even greater expansion ahead, the capacity of streams to assimilate liquid waste products of community and industrial activity will become a factor of increasing importance.

Water, by its very nature, is a multiple use resource. Since any action by one user affects all other users in the basin, cooperation among all is essential if the full potential is to be realized. Accordingly, I wish to stress three questions:

How do man-made river developments and other water uses influence waste assimilation potential? What are some of the effective ways in which expanding needs can be met by our limited water resources? Who is to take the initiative in a rational allocation among water uses, and in planning orderly development?

• Nature's way—Before dealing with these important questions, a very brief review of the process of self-purification in a stream may be helpful. Each of the three major types of pollution—chemical, bacterial, and organic—presents a different problem in self-purification.

Stable chemical wastes undergo little or no change in their journey down a river. Here the primary factor is dilution, and self-purification is almost wholly dependent upon the stream runoff available.

In a stream polluted by bacteria of sewage origin, three factors aid in self-purification: dilution takes place here as it does in chemical pollution, and in addition, bacteria are destroyed by unfavorable conditions in the stream environment. The rate at which the number of organisms diminishes is a function of water temperature as well as of time; the warmer the water, the higher the death rate. Thus, runoff (dilution), time of exposure (measured in hours or days a particle takes to travel down the river from the sewer outlet) and water temperature are the three major determinants of pollution.

Third and most general type of pollution is unstable organic matter in sewage and industrial wastes. Oxygen dissolved in the river water is utilized in the process of stabilizing this pollution. Rate of stabilization increases as temperature rises. Nature replenishes the depleted oxygen through the phenomenon of re-aeration from the atmosphere, but unfortunately the oxygen saturation capacity of water declines as temperature rises. Thus, runoff, time of passage down the river, water temperature and re-aeration are the four major factors governing organic self-purification.

In the natural setting, the waste assimilation potential available depends upon the size of the particular river in question and on how that river behaves. Rivers are dynamic. A large river in spring may become a small creek in summer. But natural runoff, while variable, is orderly in that it follows the laws of chance. Range of runoff and drought severities can be determined by statistically analyzing records of these orderly variations.

Behavior of a river depends upon the physical characteristics of the channel along its course. Where the channel is shallow and steep the time of passage is rapid and short with good re-aeration; where deep and meandering with natural pools, the time of passage is slow and long with poor re-aeration. Also, time of passage down the river varies inversely with runoff, being slowest and longest during droughts.

Thus, in the natural setting waste assimilation capacity is not a fixed quantity but rather a range in potential depending upon size and behavior through each reach of the river.

• Man's influence—When man enters the picture, nature's orderly system is altered. Depending upon how planned and operated, man-made river developments can be either beneficial or detrimental to waste assimilation potential.

Probably the least appreciated but most significant impact stems from hydro power developments. A hydro dam radically changes the channel characteristics, creating a pool which greatly lengthens the time of passage. This results in a heavy demand upon dissolved oxygen, as do also sludge de-

(Continued on page 40)

posits in the slowly moving pool. At the same time, the rate of re-aeration is diminished through the pool area by virtue of the increase in depth and reduced turbulence.

Methods of operation of the hydro plant may be very damaging as well. Diurnal pulsations in discharge are introduced and in instances little or no stream flow is permitted to pass downstream during weekend shutdowns. Run of the river hydro plants with only small pondage are the worst offenders. In our studies for new industrial locations we have been obliged to discourage otherwise advantageous sites because of such practice; in one instance virtually three-quarters of the downstream waste assimilation capacity was destroyed by such hydro plant operation.

On the other hand, upland hydro developments based on large storage may increase waste assimilation potential greatly by augmenting flow during the dry weather season. But to realize such potential either storage release rules must assure a sustained flow or a reregulating reservoir must be provided below the power plant to smooth out diurnal and weekend pulsations. On the Savannah River the recently constructed Clark Hill development virtually eliminates natural droughts. A sustained flow of 6,240 cfs at Savannah Harbor is assured even during recurrence of an extreme drought such as that of 1931 when the natural flow was 1,500 cfs. On the Jackson River similar benefits are realizable from the proposed upland multiple purpose developments where an eight-fold increase in stream discharge will be assured for waste assimilation needs at Covington, Va., and downstream. In both basins provision of reregulating reservoirs below the hydro plants makes possible these substantial corollary benefits.

Unfortunately, not all power interests recognize this. Let us look at another basin where a large upland project under construction does not provide reregulation. Release rules proposed will induce a radical change in stream discharge from 6,000 cfs during peak hours of week days to a low through the weekend of 600 cfs, only slightly above the natural drought yield. Reregulation could raise the weekend low of 600 cfs to a sustained flow of 1,700 cfs.

Even small, local flood protection works may prove detrimental. We found in one instance that proposed channel deepening and alterations for flood protection within a highly industrialized community would so greatly lengthen time of passage during low runoff season as to negate the stream improvements that would result from sewage and waste treatment works now under construction in the area.

Navigation works, likewise, may have beneficial or detrimental impact on waste assimilation capacity. Run of the river lock and dam type is particularly damaging because the deep slack pools permit sludge deposits, lengthen time of passage, and reduce rate of re-aeration. On the other hand, navigation developments that rely upon upland storage to maintain a high river stage during the dry weather season provide a corollary benefit.

Returning to consideration of an artificial pool created by a dam in the natural channel, while a greater proportion of the burden of self-purification is placed on the pool area above the dam it is recognized that a smaller proportion thereby remains for the reaches below. In this sense the dam and pool are the equivalent of a treatment works installed in the stream channel protecting the downstream reaches. Shallow artificial ponds along highly industrialized rivers are deliberately employed for that purpose with great economy and effectiveness on a number of European streams.

The damaging effect of direct diversion for water supplies or irrigation without compensation from storage should be obvious. A case in point—over one-half of the drainage area of a small highly industrialized river is diverted to water supply for a distant metropolitan area. No attempt is made to compensate for low runoff during the critical dry season, although this could easily be provided. This particular diversion is disastrous to the assimilation capacity of the river and is a factor in the industrial decline of the region. Though high priority for public water supply is universally recognized, it should not imply a license for completely ignoring other uses and needs.

The four types of man-made river developments discussed emphasize the great impact of one water use upon another. The goal, a rational balance among uses, is not attainable through arbitrary action, prolonged court proceedings or rigid legislation. Cooperation, based upon thorough evaluation and quantitative facts, is the only sure guide to effective utilization of our water resources. Given the facts, people usually act rationally.

• **Future's hope**—Looking to the future, what are the prospects of our limited water resources meeting the needs of an expanding industrial society? Five avenues of approach hold promise; all five need attention.

The first is a concerted effort to reduce the pollution loads discharged to our streams both by inplant process tightening and by waste treatment. It must be remembered, however, that treatment at its very best provides only a percentage reduction, with always some residual going to the stream. Technical and economic limitations make it unrealistic to depend upon treatment alone.

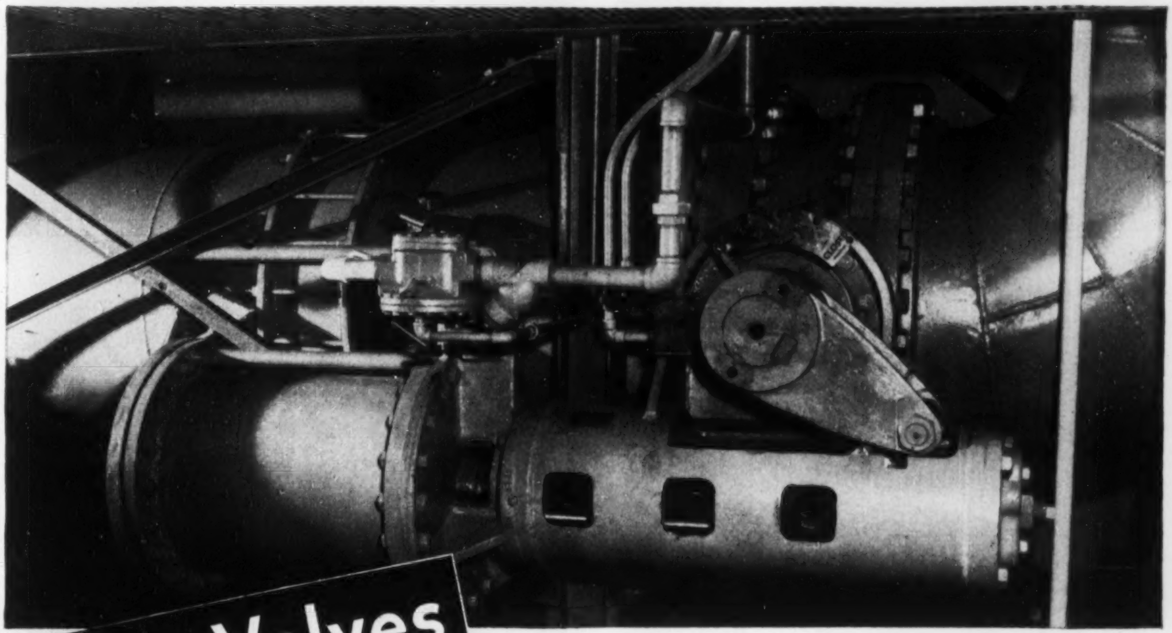
Possibilities of increasing the size of our rivers will receive more attention in the future. By decapitating flood waters and releasing them during the low runoff season, it is often possible to sustain a discharge of four to eight times the natural drought flow.

A third consideration is more rational water quality criteria consistent with wide variations in water resources and community and industrial needs. Objective criteria will be related to drought frequency and will recognize differences between warm and cold climate streams and between inland waters and relatively deep tidal estuaries. Administrative flexibility is necessary to meet the dynamics of the situation.

A fourth approach is more efficient utilization of the range of waste assimilation potential unique to each particular river. To avoid over use or under use the range must be quantitatively defined in terms of allowable loading. Efficiency can be increased by tailoring the waste load to seasonal variation in stream runoff, either by temporary lagooning wastes or by planning flexible mill production. Great efficiency can be gained and pollution problems avoided through intelligent location of new mills.

Lastly, careful planning and orderly development of multiple water uses will minimize conflicts and maximize mutual benefits. Often each specialized developer (in power, navigation, water supply, irrigation, or flood control) acts as though in a hermetically sealed cell, with little regard to his impact upon others, and most frequently with no thought of the influence of his project on waste assimilation potential. Obviously, a broader and longer view is needed. Here water policy and statesmanship play an important role.

• **Whose problem?**—The United States has been forced by world events to expand its production tremendously. In no small measure our ability to meet these expanding needs will depend upon the intelligence with which we use our limited water resources. The challenge is here. Will industry take the initiative in formulating water policy and in organizing orderly river development, backed by an informed public? Or will it leave the planning to others and quietly suffer what is imposed?



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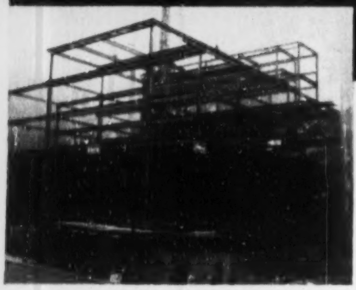

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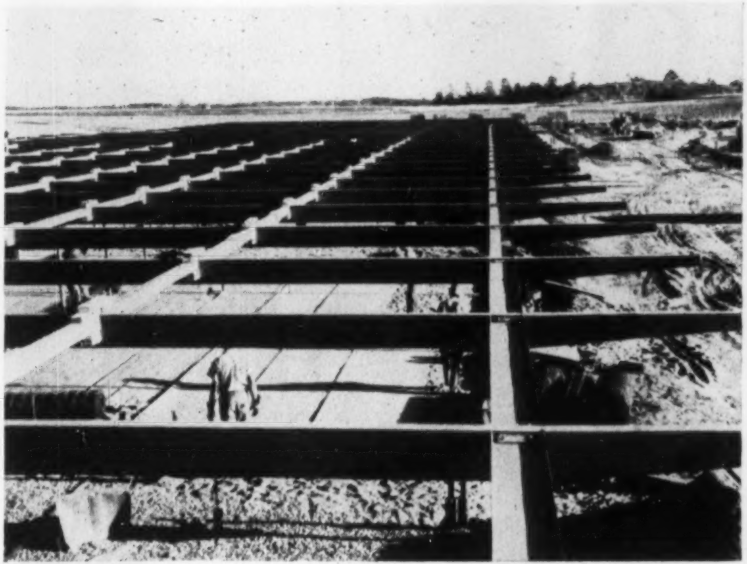


RIGID FRAMES for a school in South Carolina are composed of light steel members.

Light steel frame erected at low cost

Speedy erection was achieved at low cost for the steel frame of the one-story Fountain Inn-Simpsonville High School near Spartanburg, S. C. This performance is credited to a fabricating scheme thought up by architect W. E. Freeman, Jr., of W. E. Freeman & Associates, Greenville, S. C.

Box-shape members were formed with light steel channels and assembled by welding into rigid frames, which were prestressed to relieve some of the dead-load stresses. The object was to achieve maximum strength at minimum expense.

R. I. Brown, superintendent for Claussen & Webster Construction Co., of Augusta, Ga., the general contractor, reports that 30 bents in the first section of the main structure were erected in only 21 working hours, including necessary field welding. His cost for field connections, erection and plumbing these bents was only about $29 per ton. However, he expects to be able to lower this figure on remaining work because of experience gained to date. (The initial section took 25 tons of steel; the whole job will require 164 tons.)

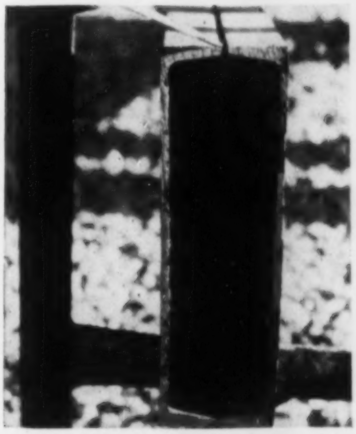
• Prestressed frames—Girders of the rigid frames were fabricated by welding together the flanges of a pair of 10-in., 6½-lb hot-rolled channels (Jones & Laughlin junior channels). Two lengths of these box-shape members were welded together in the field to make 72-ft long girders. While they were still on the ground, 6-ft long tapered sections were butt welded to the ends, to support overhangs, and pipe columns attached at interior points. Also, a mitered connection between girders and box-shape exterior columns was made by butt welding.

This connection played an important role in prestressing the rigid frames. When it was made, the bottom of the column was set ¾ in. out of alignment (away from the interior column). However, when a bent was lifted for erection, supported at two points by cables attached to the girder, the bent's weight brought the outer columns back into alignment. Anchor bolts fitted exactly, so that only one man was needed at each support. At the same time, a camber of ⅝ in. in a 30-ft span was created.

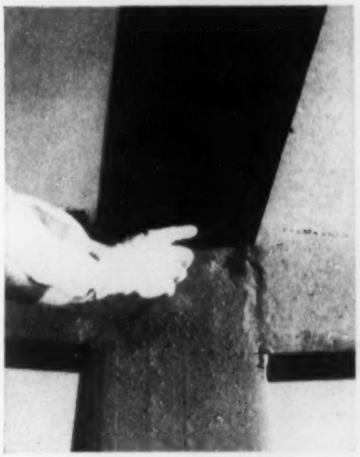
Permanent spacers were inserted between the rigid frames above the outer row of columns. Consisting of 10-in. junior channels, they were bolted to studs that had been welded to the top of the girders. To align the girders in the interior of the structure, temporary wood spacers and cables were installed, though little adjustment was needed.

• Enclosure—The roof will consist of insulation board, supported on bulb tees spanning between the bents, cast-in-place gypsum and builtup roofing. A steel angle along the outer end of the overhang will act both as a form for the gypsum and as a facia.

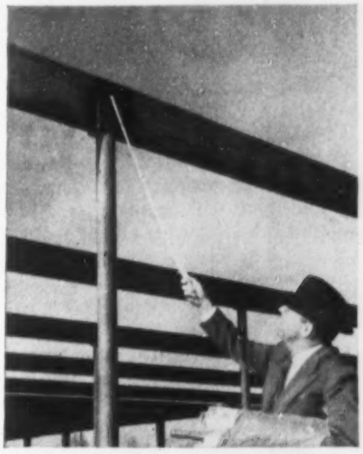
Exterior walls of the building will be brick to sill height, with windows extending to the channel spacers. The bents will be left exposed throughout the building, and for the sake of appearance, welds that will be visible were ground flush.



LIGHT CHANNELS were welded together to form hollow-box girders.

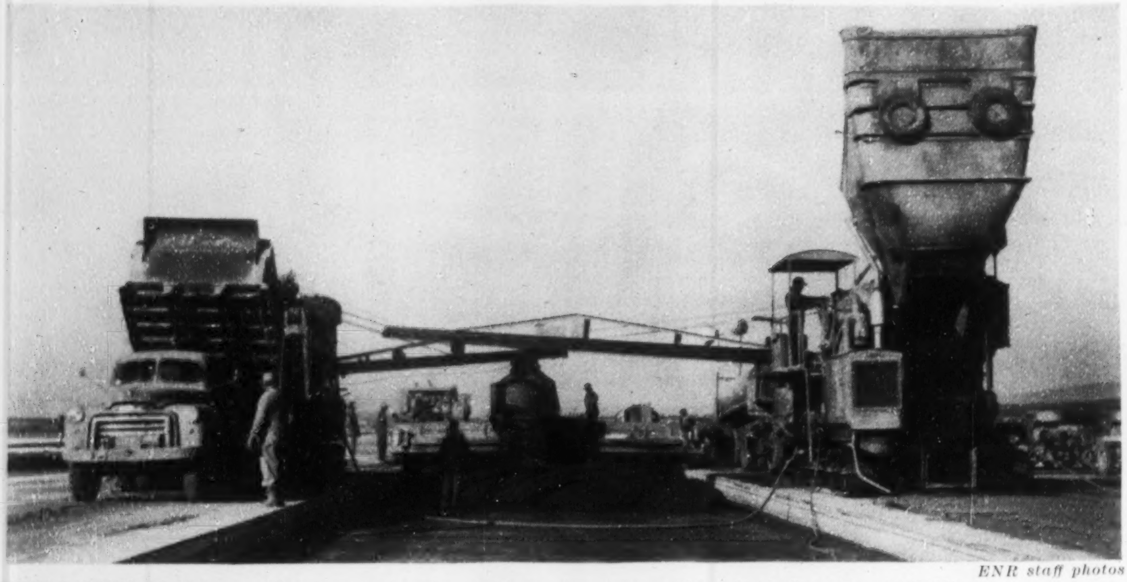


CHANNEL SPACERS were bolted to bents at the mitered connection of girder and outer column.



BOX GIRDERS were spliced by butt welding above a pipe column, which was welded to them.

F. Coleman Smith is field supervisor for the architect. R. J. Gauger, of Augusta, Ga., was consulting structural engineer. And Greenville Steel and Foundry Co. fabricated the steel.



ENR staff photos

TWO PAVERS TEAM up to place concrete for 19-in. thick warm-up apron at Edwards Air Force Base in California.

Concreting the world's longest runway

Concrete placing at Edwards Air Force Base in California's Mojave Desert got into full swing early this year, in a program that includes the longest runway in construction history—15,000 ft. Work will continue throughout 1954, with the last concrete of the more than 400,000 cu yd expected to go into place by the year's end.

Designed for a plane loading of 500,000 lb (substantially greater than the largest plane now in existence) using a 90-day flexural strength of 620 psi, the pavement is 17 and 19 in. thick.

This 19-in. thickness obtains for the taxiway, parking apron, warm-up apron, the final 1,000 ft at each end of the runway and 500 ft of runway at the center taxiway. In other words, where there will be many repetitions of static load, the pavement is 19 in. thick. The central part of the 15,000-ft strip is 17 in. thick.

The Air Force Flight Test Center (AFFTC), under the command of Brig. Gen. J. Stanley Holtoner, is located at Edwards Air Force Base. One of nine such centers in the Air Research and Development Command, the AFFTC has the mission of accomplishing flight tests and related research and development of aircraft, power plants and allied equipment. These are carried out primarily by the Air Force, but also by all branches of the armed services and their contractors (i.e. plane manufacturers). Such other federal agencies as the National Advisory Committee for Aeronautics and the Civil Air Administration use the Edwards test facilities too.

The critical demands of flight research work impose stringent requirements on the runway design. These include uniform grade, additional width and length, and high load resistance. For this reason, the new strip at Edwards AFB in no way can be considered a prototype for future runways for military or commercial use.

The runway work is part of a construction program that will convert a temporary World War II training base into a permanent test facility. Some $40 million has been appropriated under a master plan of development that calls for an ultimate expenditure of $120 million. Work done to date includes barracks, housing, roads and streets, a complete utilities system, warehouses and relocation of 26 miles of Santa Fe Ry main line.

• Pavement design—The 90-day concrete flexural strength design basis is a recent change from the old Corps of Engineers standard of 28-day flexural strength. As a matter of fact, designs upon which the Edwards work was bid were based on the old standard. But bidding designs for Corps of Engineers work represents only a close approximation of the final design; actual thickness is based on tests of aggregate samples selected for use by the contractor so final thickness could be computed on the new basis.

In shifting from the 28-day to the 90-day flexural strength, one Corps of Engineer source estimated that it would result in a saving of as much as 2½ in. in the thickness of major pavements. This did not prove to be true at the Edwards base. There the reduction was said to be only about 1 in. from what it would have been on a 28-day strength basis. Designs are based on a family of curves for typical aggregates in the area. Increase in strength from 28 to 90 days for concretes in the South Pacific Division area have proved to be quite nominal.

Actually, the pavement at Edwards is 1 in. thicker than anticipated by the original design. But this increase in thickness is attributed to a weaker-than-expected aggregate submitted by the contractor for detailed design of the pavement.

For control purposes, a 14-day strength is included in the specifications. In other words, the concrete must be strong enough at 14 days to indicate it will meet the 90-day design basis. It would be impracticable to require a contractor to wait 90 days to have work accepted.

Flexural strength on Corps of Engineers work is based on breaking of concrete beams 30-in. long and 9x9 in. in across section with aggregate in excess of 1½ in. wet-screened out.

The 19-in. thickness for taxiways and the ends of the runway results from the design for flexural strength. The central portions of the runway are reduced in thickness 10% (or in this case 2 in.) because they will be subject to far less repetitions of static load than will the other areas.

Concrete mix includes these features: 5.88 sacks of cement per cu yd, 28% sand-aggregate ratio, 4% air entrainment, and 1½-in. slump. Aggregate is supplied in 3 sizes of rock (#4 screen to ¾ in., ¾ in. to 1½ in., and 1½ in. to 3 in.) plus sand. Distribution of aggregate as used follows these proportions:

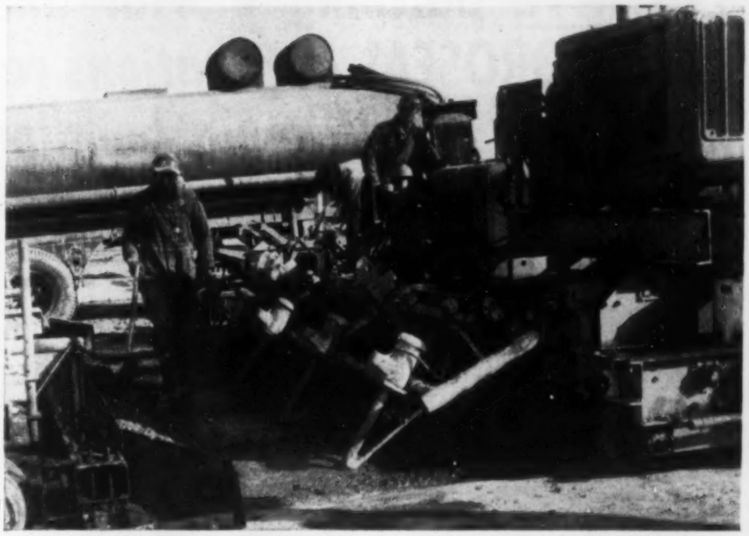
Screen size	Percent passing	Screen size	Percent passing
3-in.	100	#4	29.4
2-in.	83.2	#8	26.1
1½-in.	70.1	#16	20.0
1-in.	56.4	#30	13.3
¾-in.	48.0	#50	6.1
⅜-in.	32.6	#100	1.5

The runway has a 0.14% grade. This requires about a 5-ft cut at the middle with a similar fill at each end. Total excavation is 1,400,000 cu yd and borrow is 450,000 cu yd. Subgrade is compacted to 90% of modified AASHO density to a 12-in. depth.

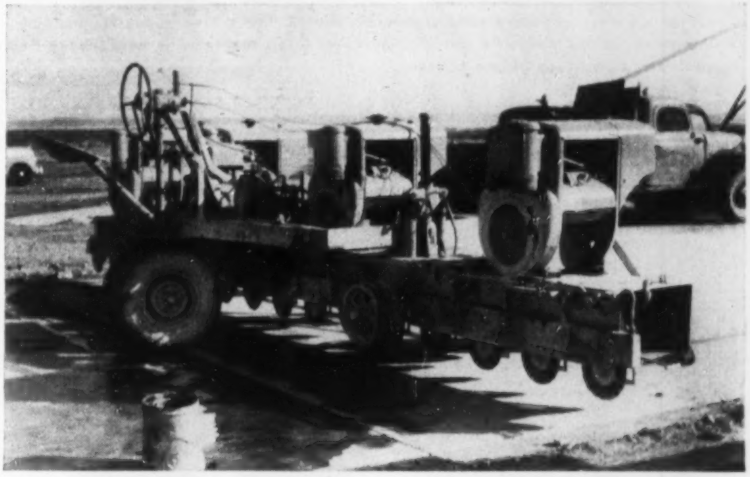
Transverse slope on the 300-ft wide runway is ½% with a crown at the center. The shoulders are graded on a 1½% slope for an additional 200 ft.

The 100-ft wide taxiways have a 1½% transverse slope with a crown in the center. An additional 100 ft on each side of the taxiways is graded to the same slope and 70 ft of this is paved with a 2-in. bituminous surface course on a 6-in. stabilized aggregate base coated with prime coat. The purpose of this bituminous shoulder is for protection from jet blast. Jet pods on some planes already extend beyond the 100-ft wide concrete paving.

One other design requirement is that the taxiways and the ends of the runways be constructed of heat resistant aggregate. At Edwards the aggregate submitted by the contractor for regular use was found satisfactory. If it had not been, those parts of the pavement requiring heat resistant aggregate would have had to be constructed in two lifts with the second lift placed soon enough after the first lift to bond to it.



BATTERY OF VIBRATORS mounted on the concrete spreader works air out of the fresh concrete. Note that workman walking on fresh concrete does not sink far. This demonstrates stiffness of the mix.



16-BLADED SAW JIG cuts contraction joints in concrete. Machine is self-propelled and blades have transverse travel of about 2 ft in cutting operation. Dummy joints spaced each 25 ft are ⅛ in. wide and 4 in. deep. Later they will be filled with a tar-rubber compound.

• Construction procedure—Paving work anticipates production of 2,000 cu yd of concrete a day. This figure is the capacity of the batching facilities and is based on the amount of cement that the contractor expects to have delivered during the summer months. Cement in the southern California area is in tight supply during the construction season. In spite of receiving deliveries from three different cement manufacturers, the contractor does not expect that deliveries will permit greater production.

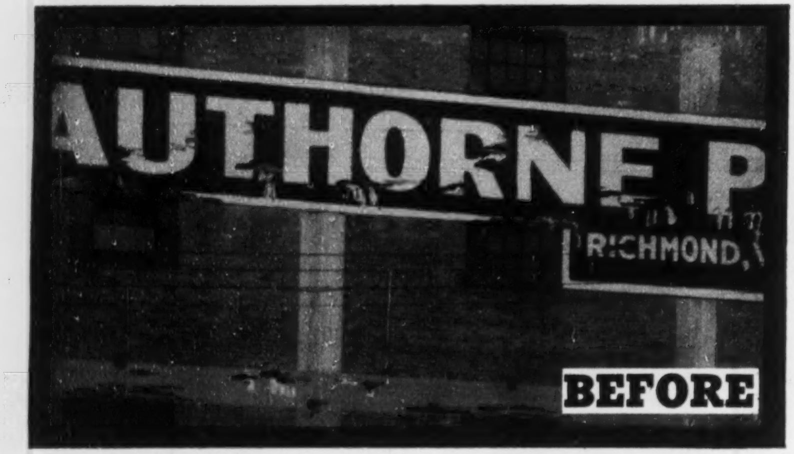
Actually, the 2,000-cu yd a day figure was not reached during the first two months of work. The reason is that during the winter months an 8-hour shift is being worked. In the spring and summer this will be extended to a 10-hour shift. Another reason for production below the expected rate is the normal delay at the start of any major job in working out bugs in the machinery and developing team work among the workmen.

Concrete is mixed in two 34E pavers. Batches are supplied the pavers by trucks holding five batches each. Some 15 trucks are employed continuously in hauling the mix to the pavers.

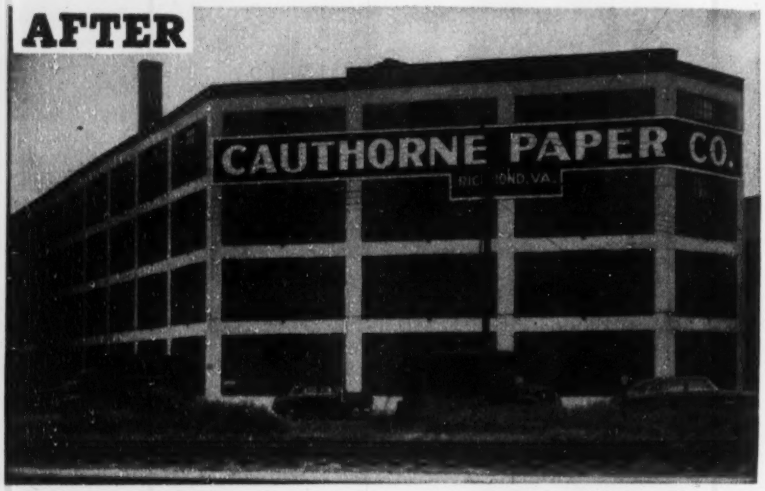
First machine following the pavers is a concrete spreader. Mounted on the rear of the spreader is a battery of six internal vibrators. Original installation was ten of these units but that provided much more agitation than was found necessary to do the job.

Following the spreader is a mechanical finishing machine called by the contractor a "longitudinal finisher" that includes two transverse vibrating screeds. These are spaced some 15 ft apart, and the entire machine has a 30-ft wheel base. The contractor hoped that this machine would provide a surface of adequate longitudinal smoothness. However, the

THORITE ***patching mortar and two*** **THOROSEAL** ***applications rejuvenated this Virginia building***



Constant weather exposure over the years caused the masonry of this building to disintegrate. If this unsightly condition had not been corrected it would have finally imperiled the structure of the building.



All concrete spandrel beams, columns, window heads and brick sills were patched and brought flush with surrounding surface by the use of The THORO System product, THORITE, a twenty-minute set, nonshrink, patching mortar. Two brush coats of THOROSEAL were then applied over entire reinforced concrete surfaces, to prevent further disintegration, also to beautify building.

CONTRACTOR: Southern Waterproofing and Concrete Company, Inc.,
1704 Arlington Road, Richmond, Virginia.

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THORO
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STANDARD DRY WALL PRODUCTS INC.
NEW EAGLE, PENNSYLVANIA

Corps of Engineers is insisting that the specification requirement of longitudinal floating with a mechanically operated float be fulfilled. So such a machine follows next.

Curing compound is sprayed on the pavement from a "bridge" mounted on wheels that follows the construction train.

• **Sawn joints**—A special machine is used to cut the transverse dummy contraction joints into the pavement. This self-propeller unit includes 16 rotary saw blades powered by four 31-hp engines. The blades make the $\frac{1}{8}$-in. wide by 3-in. deep cut with only 2 ft of transverse travel.

During the winter months the joints are cut some 24 to 26 hours after the concrete is laid. Later on, when the weather becomes warmer, the concrete will set faster. Then it is expected that the sawing can be done some 8 hours after the concrete is placed.

The contraction joints are to be filled by a fuel resistant tar-rubber compound. As of this writing, the means of introducing this material into the joint have not been developed fully. It is expected that a nozzle arrangement that introduces the hot compound under pressure into the bottom of the crack will be adopted.

The pavement is laid in 25-ft wide strips. On the parking apron and warm-up apron these strips are placed alternately. On the taxiway and runway one continuous 25-ft wide strip will be laid first, adjacent to the center line. Then the paving will continue with one set of wheels of the equipment operating on the previously laid concrete and the other set operating on steel forms.

• **Management**—Planning work at Edwards is accomplished by a base development staff headed by Lt. Col. M. P. Elvin. Design and construction of the facilities are handled by the Los Angeles District, Corps of Engineers, Col. Arthur H. Frye, Jr., district engineer. George P. Davis is project engineer for the corps and W. W. Zimmerman is assistant project engineer on the runway work.

Liaison between Air Force and Corps of Engineers is conducted by the staff of Col. S. M. Lutz, Jr., Air Force installations representative, South Pacific Division.

The paving work is being carried out under a $\$6\frac{1}{2}$-million contract by a joint venture of R. A. Westbrook; Morrison-Knudsen Co., Inc., and Ford J. Twaits Co. The Westbrook organization under partner Ross Westbrook is sponsor of the joint venture. D. Gerald Bing is project manager.

NEW!

THREADED CONES

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CONE-FAST COIL TIES

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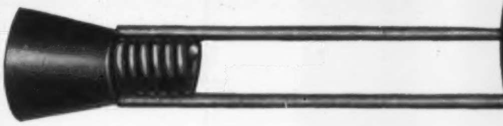
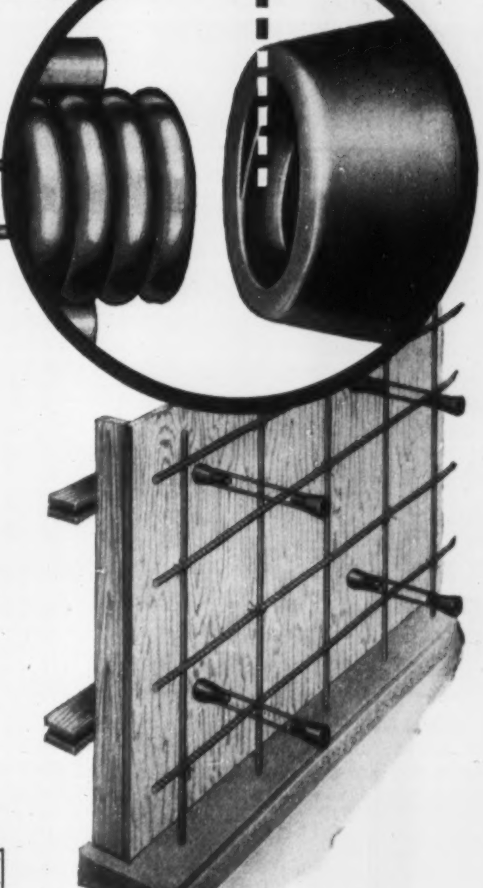
Cuts Form Costs by Permitting Extra Fast Erection of Panels

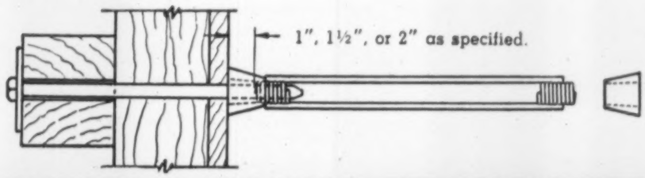




A direct way to cut forming costs is to use new Superior *Threaded* Coil Cones with Cone-Fast Coil Ties. Where cones have to be dependably held in place, *Threaded* Coil Cones are practically a "must".

Previously, Coil Cones were held onto the extended coils by friction alone. Now, a couple of threads in the cone fix Coil Cones securely to the Coil Ties. Here's another advantage . . . units can be bench assembled with the assurance that they will arrive at the installation point intact! *Threaded* Coil Cones cannot be knocked off the Coil Ties when the opposing form is being applied. When unscrewed with a cone wrench, the threaded Coil Cones automatically back themselves out of the wall.

Cone-Fast Coil Ties with threaded Coil Cones are supplied for 1/2" to 1 1/4" Coil Bolts, with safe load capacities from 5,000 lbs. to 36,000 lbs. Working parts (cones and bolts) are returnable for credit.



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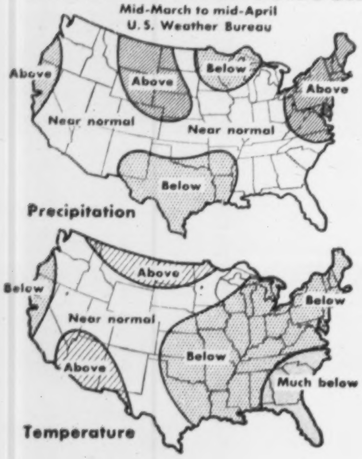
WEATHER

30-DAY WEATHER OUTLOOK

Mid-March to mid-April
U.S. Weather Bureau



Observed weather in 20 cities, compared with normals

City	Precipitation, inches Feb. 1954	Departure fr. normal	2 mos. 1954	Departure fr. normal	Temperature, degrees Mean Feb. '54	Departure fr. normal	Av. daily Maximum	Av. daily Minimum
Atlanta	2.07	−1.12	5.80	−0.94	50.1	+ 3.4	61.6	38.6
Baltimore	1.21	−1.78	3.23	−3.42	40.9	+ 5.9	51.4	30.4
Birmingham	3.37	−1.80	9.72	−0.43	51.2	+ 3.5	64.6	37.8
Boston	3.37	+0.44	6.63	+0.20	36.4	+ 7.2	43.9	28.9
Chicago	2.40	+0.99	3.50	+0.25	37.6	+10.2	45.5	29.6
Cincinnati	1.96	−0.59	4.30	−1.69	42.7	+ 7.1	52.2	33.1
Cleveland	2.88	+0.76	6.00	+1.50	36.3	+ 7.7	44.2	28.4
Dallas	0.70	−1.92	3.73	−1.36	56.9	+ 7.1	70.4	43.3
Denver	0.06	−0.50	0.21	−0.85	46.0	+11.5	59.5	32.4
Detroit	3.49	+1.47	5.17	+1.06	33.5	+ 6.8	40.1	26.8
Kansas City	1.75	+0.59	1.80	−0.79	45.4	+10.8	56.2	34.5
Los Angeles	2.98	−0.39	7.58	+1.83	64.1	+ 7.7	90.0	44.0
Minneapolis	0.32	−0.57	0.57	−1.12	31.8	+13.6	39.9	23.6
New Orleans	1.90	−2.28	5.66	−3.30	61.8	+ 3.3	71.6	52.0
New York	1.63	−1.50	3.40	−3.19	40.2	+ 7.5	47.6	32.8
Philadelphia	1.57	−1.46	3.61	−2.81	42.4	+ 7.3	50.8	34.0
Pittsburgh	1.74	−0.61	3.69	−1.49	40.4	+ 6.8	48.3	32.4
St. Louis	0.62	−1.26	2.13	−2.07	45.0	+ 8.3	54.4	35.6
San Francisco	2.42	−1.49	5.53	−2.41	54.0	+ 1.0	60.6	47.3
Seattle	5.31	+1.57	13.95	+5.72	45.1	+ 1.6	50.5	39.7

Precipitation range in 20 cities, in inches

Table shows range observed 33.3% of time. Rainfall heavier 33.3% of time, lighter 33.3% of time.
Computed by U. S. Weather Bureau (based on historical records of actual precipitation)

City	March	Mid. Mar.-Mid. Apr.	April	Mid. Apr.-Mid. May	May	Mid. May-Mid. June	June	Mid. June-Mid. July	July	Mid. July-Mid. Aug.	Aug.	Mid. Aug.-Mid. Sept.	Sept.	Mid. Sept. Mid. Oct.
Atlanta	3.43/6.33	3.12/5.72	2.82/5.10	2.48/4.72	2.14/4.33	2.50/4.38	2.87/4.43	2.93/4.62	2.99/4.80	2.89/4.90	2.79/5.00	2.24/4.30	1.69/3.60	1.64/3.25
Baltimore	2.59/4.13	2.59/4.17	2.58/4.20	2.76/4.30	2.94/4.40	2.73/4.42	2.52/4.44	2.57/4.71	2.61/4.98	2.91/5.32	3.20/5.66	2.65/4.51	2.10/3.36	1.88/3.57
Birmingham	4.48/6.63	3.91/5.85	2.94/5.07	3.05/4.81	3.16/4.55	2.90/4.70	2.64/4.84	3.29/5.18	3.94/5.53	3.44/5.39	2.92/5.25	2.32/4.47	1.71/3.69	1.62/3.14
Boston	2.94/4.50	2.66/4.45	2.39/4.40	2.58/4.29	2.76/4.18	2.42/3.84	2.09/3.50	2.35/3.76	2.61/4.02	2.60/4.36	2.59/4.70	2.32/4.20	2.04/3.70	2.26/3.88
Chicago	1.99/3.11	2.09/3.12	2.19/3.13	2.24/3.56	3.16/4.00	2.29/3.88	2.42/3.67	2.46/3.66	2.49/3.65	2.31/3.65	2.13/3.65	2.11/3.70	2.09/3.75	1.85/3.42
Cincinnati	2.39/4.29	2.66/3.94	2.34/3.60	2.42/3.85	2.49/4.10	2.59/4.30	2.69/4.50	2.54/4.10	2.39/3.70	2.32/3.95	2.24/4.20	2.02/3.64	1.79/3.08	1.64/2.99†
Cleveland	2.10/2.98	2.15/3.13	2.20/3.27	2.27/3.38	2.33/3.49	2.17/3.53	2.00/3.56	2.24/3.82	2.47/4.08	2.15/3.84	1.83/3.60	2.07/3.51	2.30/3.41	2.03/3.29
Dallas	2.34/3.86	2.50/4.68	2.66/5.50	2.82/5.38	2.99/5.25	2.39/4.85	1.79/4.45	1.59/3.72	1.39/3.00	1.30/2.89	1.22/2.78	1.50/2.94	1.77/3.10	1.66/3.30
Denver	0.59/1.10	0.96/1.75	1.34/2.40	1.48/2.65	1.62/2.90	0.64/2.32	0.67/1.75	0.94/1.88	1.21/2.00	1.04/1.86	0.87/1.73	0.60/1.39	0.52/1.05	0.57/1.08
Detroit	1.77/2.78	1.78/2.76	1.79/2.73	2.14/3.20	2.49/3.67	2.66/3.88	2.84/4.10	2.46/3.90	2.09/3.70	1.94/3.54	1.79/3.38	1.80/3.41	1.82/3.44	1.72/3.02
Kansas City	1.59/2.90	1.99/3.15	2.39/3.40	2.82/4.40	3.24/5.40	3.42/5.82	3.61/6.25	3.19/5.47	2.77/4.69	2.74/4.84	2.70/5.00	2.84/5.00	2.99/5.00	2.34/4.54
Los Angeles	1.13/2.95	0.68/1.92	0.22/0.90	0.14/0.62	0.05/0.35	0.02/0.18	0.00/0.02	0.00/0.01	0.00/T	0.00/T	0.00/T	0.00/0.02	T/0.03	0.08/0.32
Minneapolis	0.98/1.67	1.34/2.14	1.69/2.60	2.16/3.29	2.64/3.98	2.89/4.49	3.14/5.00	2.64-4.50	2.14/4.00	2.16/3.85	2.19/3.70	2.24/3.78	2.29/3.85	1.79/3.15
New Orleans	3.22/5.30	2.94/5.15	2.66/5.00	2.65/5.12	2.64/5.25	3.18/5.88	3.72/6.50	4.54/6.95	5.37/7.40	4.90/7.08	4.44/6.75	3.78/6.12	3.11/5.50	2.55/4.81
New York	2.34/4.05	2.40/3.92	2.47/3.78	2.50/3.90	2.54/4.02	2.45/3.91	2.36/3.80	2.81/4.25	3.26/4.70	2.99/4.95	2.72/5.20	2.46/4.30	2.21/3.40	2.15/3.76
Philadelphia	2.62/4.00	2.56/3.91	2.49/3.82	2.44/4.11	2.39/4.40	2.54/4.25	2.69/4.10	2.94/4.24	3.19/4.37	2.99/4.91	2.79/5.45	2.44/4.62	2.09/3.90	2.04/3.85
Pittsburgh	2.34/3.47	2.32/3.44	2.29/3.40	2.39/3.58	2.49/3.75	2.68/3.98	2.86/4.20	2.79/4.35	2.72/4.50	2.52/4.15	2.32/3.80	2.20/3.30	1.87/2.80	1.98/3.00
St. Louis	2.27/3.95	2.43/3.88	2.59/4.10	2.86/4.65	3.13/5.20	2.96/5.25	2.79/5.30	2.60/4.78	2.41/4.25	2.28/4.18	2.14/4.11	2.12/3.84	2.09/3.58	1.89/3.42
San Francisco	1.94/3.55	1.30/2.54	0.67/1.54	0.44/1.12	0.18/0.69	0.09/0.37	0.00/0.05	0.00/0.03	0.00/0.01	0.00/0.00	0.00	0.00/0.13	0.00/0.26	0.10/0.78
Seattle	1.81/3.43	1.72/3.16	1.64/2.90	1.53/2.45	1.42/2.00	1.09/1.86	0.76/1.73	0.48/1.20	0.19/0.67	0.18/0.78	0.18/0.90	0.62/1.55	1.07/2.20	1.70/2.85

T—Traces (Less than 0.005 inches) † Lexington

Mean temperature range in 20 cities, in degrees F.

Table shows range observed 25% of time. Mean temperature higher 37.5% of time, lower 37.5% of time.
Computed by U. S. Weather Bureau (based on historical records of actual temperature)

City	March	Mid. Mar.-Mid. Apr.	April	Apr.-Mid. Mid. May	May	Mid. May-Mid. June	June	Mid. June-Mid. July	July	Mid. July-Mid. Aug.	Aug.	Mid. Aug.-Mid. Sept.	Sept.	Mid. Sept. Mid. Oct
Atlanta	51.2/53.6	55.9/58.0	60.9/62.6	64.9/66.5	69.0/70.5	73.5/74.6	77.3/78.1	78.5/79.3	79.0/79.9	78.9/79.9	78.0/79.1	76.3/78.1	72.9/75.4	68.2/70.2
Baltimore	42.0/45.7	46.6/49.4	51.9/53.6	57.5/59.0	63.4/64.6	68.2/69.5	72.5/73.8	75.2/76.6	76.2/77.5	75.5/77.3	73.6/75.7	71.1/73.3	67.1/69.4	62.2/64.4
Birmingham	52.4/54.7	56.6/56.5	61.1/62.6	64.6/66.3	68.4/70.2	72.4/74.5	76.8/78.1	78.4/79.7	78.9/80.0	79.0/80.3	78.5/79.8	76.6/78.5	73.3/75.6	68.5/70.7
Boston	35.6/38.6	41.1/43.3	46.7/48.3	51.5/53.1	56.7/58.4	56.8/58.6	66.3/68.1	69.6/71.1	71.7/73.0	72.1/73.4	70.9/72.1	67.6/69.2	63.3/65.4	58.9/61.0
Chicago	34.6/39.1	40.9/43.8	47.5/48.8	52.7/54.7	57.9/60.5	63.1/66.1	68.0/71.2	71.6/74.0	73.7/75.1	73.8/75.4	72.0/73.7	68.8/70.7	64.5/66.7	59.3/61.7
Cincinnati	39.6/43.1	45.4/48.1	51.4/53.3	56.4/58.6	61.5/64.0	66.7/68.9	71.2/73.0	73.4/75.2	74.1/75.8	73.9/75.7	72.5/74.4	70.2/72.1	66.5/68.4	61.2/63.3
Cleveland	34.7/38.8	40.3/43.2	46.2/47.8	51.8/53.9	57.9/60.3	63.5/65.7	68.2/70.2	71.2/73.0	72.7/74.2	72.5/74.2	70.9/72.7	68.5/70.6	64.7/67.1	59.5/61.8
Dallas	55.5/59.6	60.1/63.7	64.2/67.3	68.4/71.1	72.8/75.0	77.2/78.8	81.1/82.2	83.3/84.6	84.5/86.4	85.6/87.3	85.1/86.7	82.3/83.9	78.1/79.7	73.8/75.1
Denver	35.9/39.1	40.4/43.2	46.3/48.6	51.1/53.4	55.2/57.4	60.0/62.1	65.4/67.5	69.7/71.5	71.1/73.7	72.5/74.0	70.8/72.2	67.3/68.6	62.2/63.4	56.7/58.3
Detroit	33.1/37.2	39.3/42.1	45.6/47.1	51.0/52.8	56.5/58.7	62.3/64.4	67.3/69.4	70.6/72.1	72.5/73.5	72.3/73.6	70.5/72.0	67.5/69.5	63.0/65.6	57.8/60.2
Kansas City	42.9/45.9	48.6/51.3	54.9/56.7	59.9/61.7	64.6/66.4	69.4/71.2	74.2/76.0	78.0/79.6	80.0/81.5	80.2/81.8	78.4/80.1	74.6/76.6	69.7/71.9	64.4/67.0
Los Angeles	55.4/57.4	56.6/58.4	58.1/59.7	59.8/61.3	61.4/62.8	62.5/64.0	63.9/65.4	65.4/67.0	66.9/68.4	67.5/68.9	67.4/68.6	66.8/68.1	65.9/67.3	64.4/65.9
Minneapolis	29.9/32.5	37.3/40.3	44.7/47.9	51.3/54.4	57.2/60.2	62.2/64.9	66.6/69.1	70.3/72.5	72.9/74.9	73.2/75.0	70.8/72.3	66.3/68.4	61.0/63.6	55.5/58.3
New Orleans	60.6/63.0	63.4/65.7	67.4/69.1	70.7/72.1	73.8/74.9	77.0/78.1	79.9/80.9	81.0/81.9	81.4/82.3	81.8/82.7	81.8/82.7	80.8/81.9	78.5/79.7	75.1/76.5
New York	38.7/41.3	43.6/46.0	49.0/51.0	54.6/56.3	60.6/62.1	65.9/67.5	70.4/72.2	73.6/75.0	75.2/76.3	75.1/75.5	73.6/74.9	71.0/72.5	67.4/69.0	62.7/64.3
Philadelphia	40.8/43.5	45.6/47.9	50.8/52.6	56.2/58.0	62.3/64.0	67.5/69.2	71.5/73.1	74.1/75.4	75.5/76.6	75.1/76.3	73.3/74.5	70.6/72.1	66.8/68.5	61.6/63.5
Pittsburgh	36.0/40.6	43.3/46.5	48.0/49.8	53.1/55.1	58.7/60.9	63.5/65.8	67.4/69.7	70.2/72.0	71.4/72.8	71.0/72.4	69.3/70.9	67.2/68.9	64.0/65.9	58.8/60.9
St. Louis	42.9/46.3	48.6/51.5	54.5/57.0	58.4/61.9	64.0/66.6	68.7/71.5	73.5/76.2	76.9/79.0	78.7/80.2	78.5/80.1	76.7/78.5	73.6/75.6	69.1/71.2	64.0/6.63
San Francisco	51.7/53.5	52.4/54.2	53.2/55.0	54.3/55.9	55.9/57.4	57.5/59.1	58.8/60.5	59.6/61.0	59.7/60.9	59.5/60.7	60.1/61.2	60.9/62.2	61.3/62.8	60.4/62.0
Seattle	43.6/44.7	45.8/47.2	48.2/49.9	51.0/52.9	54.2/56.3	56.9/58.5	59.3/60.4	61.7/62.7	63.6/64.6	63.8/65.0	62.7/64.1	60.8/62.0	58.0/59.0	54.8/56.1

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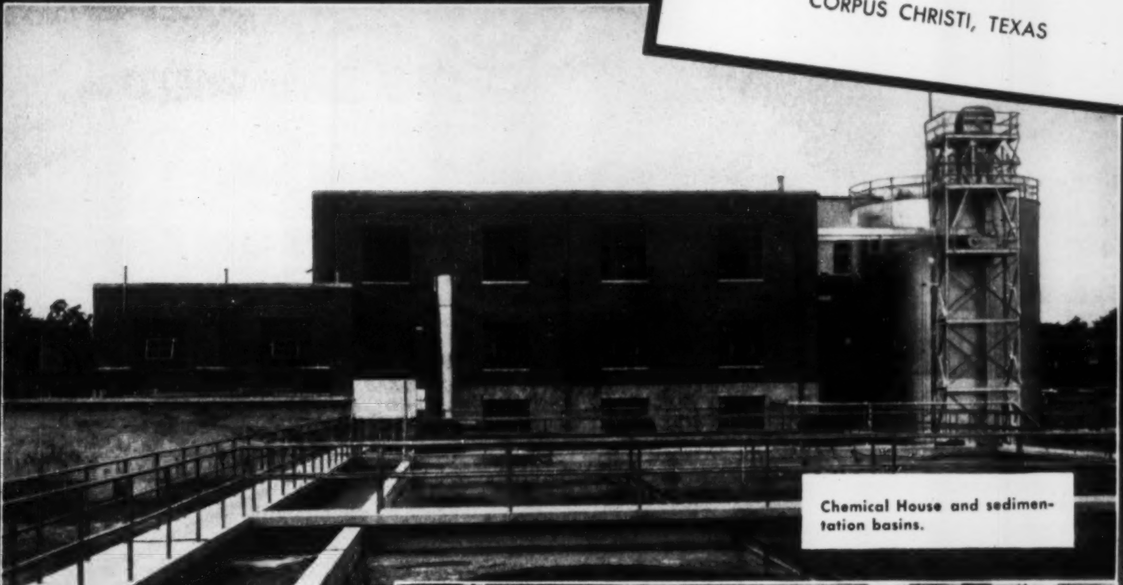
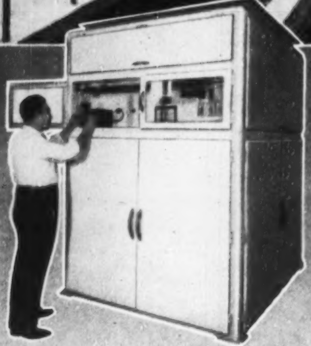


Chemical House and sedimentation basins.



Omega Loss-In-Weight Gravimetric Feeder for carbon.

Omega Gravimetric Feeders for soda ash and alum. Lime Feeders and Slakers at left.

In Dallas, where water conversion is a "must", every effort has been made to obtain optimum control of water treatment. Accurate, reliable Omega Chemical Feeders play a vital role in the controlled settling, filtration, and water softening operations at the 100 MGD Bachman Plant.

These Feeders were installed by J. G. Bartholomew, Contractor, of Dallas, Texas. For complete details describing Omega Water Works Equipment, address Omega Machine Company (Division of B-I-F Industries, Inc.), Providence, Rhode Island.

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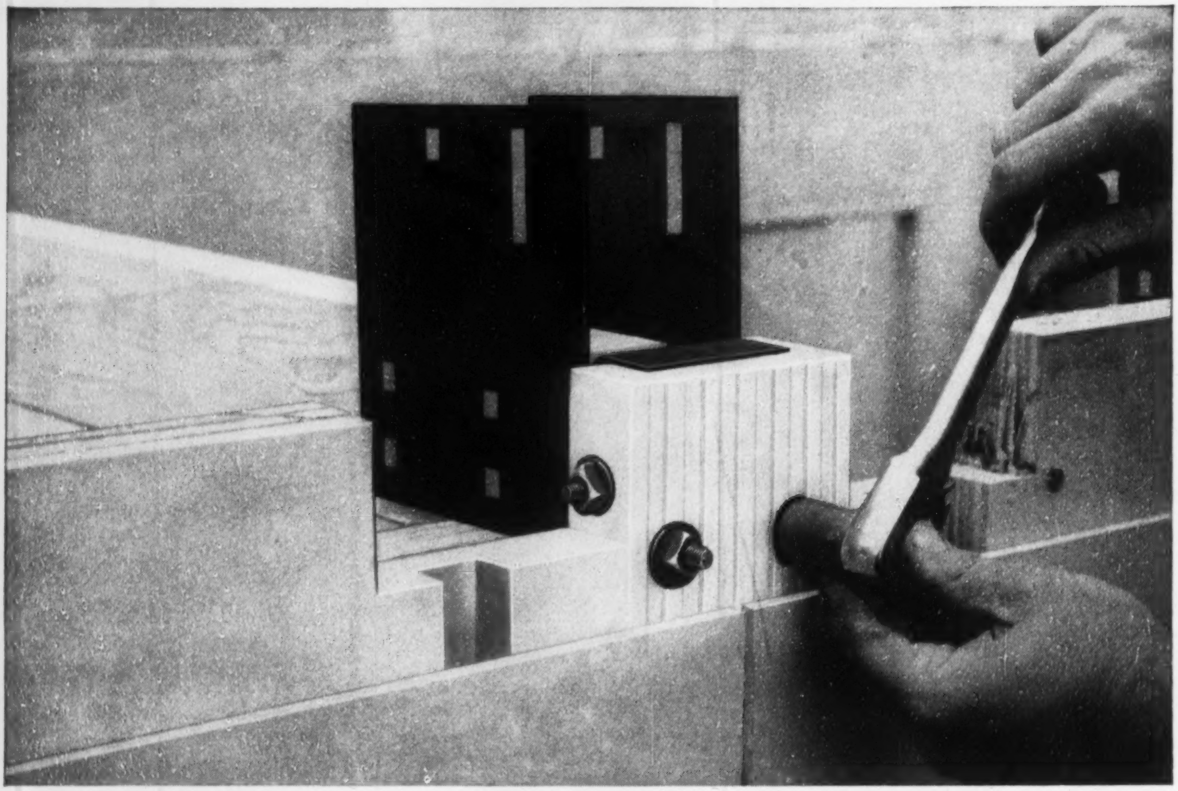


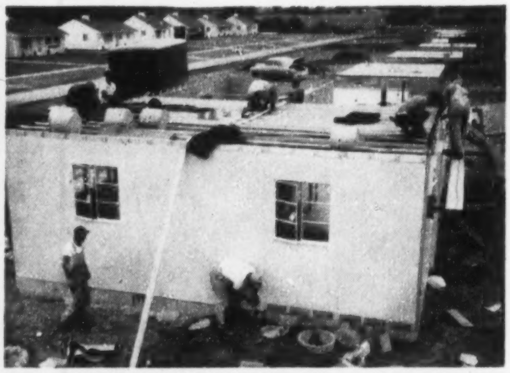
RAISING THE ROOF of a U.S. Steel home goes faster with help of RB&W bolts. Here workman is tightening bolt holding steel plate to exterior wall panel. Plate is then used as joint for bolting ceiling panels.

That's a house he's bolting together!

U.S. Steel Homes found that bolting together the panels of their fast-selling homes saves time and trouble. Nails are used only to hold panels temporarily in position for bolting and add no structural strength.

It's no accident, of course, that RB&W bolts and nuts were specified here. U.S. Steel Homes isn't the first to discover that the absolute uniformity and dependable holding power of RB&W products make them the best fasteners for any job. Workmen like the way RB&W nuts run on RB&W bolts fast and easy. And there's no question about the extra strength RB&W bolt-and-nut construction gives these homes.

Whenever you want to put something together *fast*, and make it stay fastened *for good*, give one of our men a ring. As a top-ranking maker of all kinds of fasteners, we're always able to recommend and supply the right ones for all your needs. You can count on fast delivery, too. RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N.Y.



HOUSE GOING UP. U.S. Steel home nears completion as workmen on scaffold (right) bolt on exterior panels. These sturdy homes offer quality construction at budget price.

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Third Lincoln Tunnel tube construction halted by state—and tennis—courts

ENR photo by Compton

WEEHAWKEN HUDDLE—Officials plot action in defense of tennis courts and citizens' rights.

Halted, by order of the New Jersey Supreme Court, (ENR Mar. 18, p. 17) construction operations on the third tube of the Lincoln Tunnel between midtown Manhattan, N. Y. City, and the town of Weehawken, N. J., may be stymied for weeks.

The high court, on appeal of the New Jersey town, reversed a superior court decision that last fall enjoined Weehawken from interfering with progress of construction by the Port of New York Authority, builders of tunnel (ENR June 25, 1953, p. 46).

The basis of the stop-order on the $100-million project is one of interpretation. Four justices ruled that the third tube was an independent undertaking, and, despite ultimate operation in conjunction with the existing twin-tube facility, subject to new legislation by both states.

The authority, backed by two justices, contends that the tube is an adjunct of the existing tunnel, and as such, construction is covered by the original legislation of 1931.

• Authority claims—Howard S. Cullman, chairman of the PNYA, announced that work had been closed down in conformity with the decision, but he pointed out that the construction of the third tube had been undertaken in the belief that the present statute fully authorized the construction of the third tube.

• Weehawken views—Meanwhile, officials of Weehawken are commuting to the state capitol at Trenton. Mayor Krause says that his town neither desires nor intends to obstruct the Hudson crossing—"that is a matter for the legislature to decide."

His concern is with the loss of tennis courts that lie in the path of the third tunnel approach. His town has set a price of $1.5 million on the courts and Krause believes that even that price may be inadequate for permanent loss of the coveted recreation facilities (the authority claims to have offered $570,400 for them).

Immediate New York State action in amending the 1931 law to cover past and future construction is expected, but work will be held up until New Jersey lawmakers have carried on what may be some long and heated sessions considering the case.

(*Municipal continued on page 54*)

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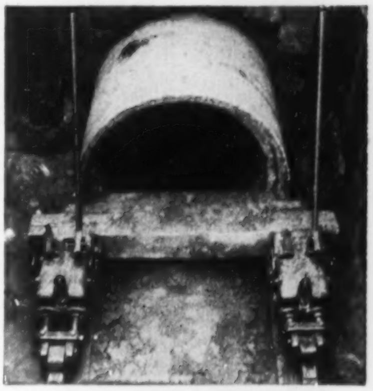

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Pictures of the month . . . *by LeTourneau-Westinghouse . . .*

Goodbye, dangerous curve — To eliminate several sharp curves along Ohio Route 3 near Loudonville, C. F. Replogle moved 40,000 yds of sandstone and dirt with his 3 C Tournapulls and 2 Carryall-Scrapers. On 1000 ft cycles, each 14-yd Tournapull delivered 10 loads per 50-min hour. Total output per Tournapull was 2.7 times that of each crawler-drawn 15-yd pan. While crawlers and pans had to be trucked to job, "C's" drove in under their own power . . . averaged 20 mph for 90-mile trip.

Building NY thruway — Working on the southern end of the New York Thruway, this Tournatractor dozes sand for approaches to the Hudson River Bridge connecting Nyack and Tarrytown. Electric-control down-pressure helps blade make smooth cut in rocky root-filled material. Unit is owned by Rusciani & Son, N.Y. City.

2 units, 3,000 yds a day — J. Tomei & Sons Construction Company, Van Nuys, Calif, is moving 400,000 yds of sand and common earth for the Hollywood Freeway with 2 C Tournapulls. Each "C" averages 1500 pay yds per 10-hour day on hauls of 400 to 1300 ft. This includes spread around overpass structures on grades of 30% favorable to 20% adverse.

Better roads for Canada — Rebuilding 23 miles of Hwy 11 between Sylvan Lake and Condor, Assiniboia Constr Co, Calgary, Alberta, used 3 C Tournapulls to speed 2000 to 9000 ft one-way hauls. Despite traffic delays on typical 4100 ft haul, each "C" delivered 7 loads (84 pay yds) of sandy clay per 50-min hour.

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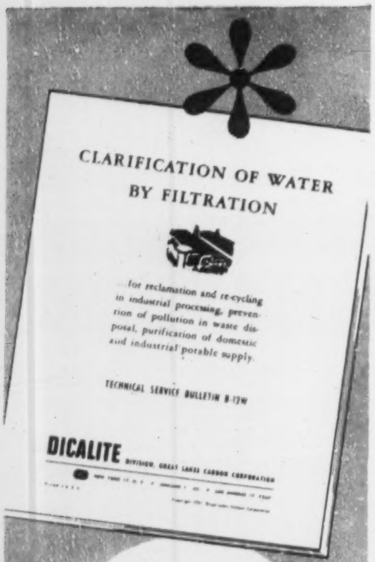
More cement for Turkey — Stripping a limestone quarry, this D Tournapull self-loaded abrasive, sun-baked clay overburden. Material, hauled 3200 ft down a steep hill, was used as fill for building site and roads. Complete 6400' cycles took 7 min. "D's" simple electric controls allowed an inexperienced Turkish worker to operate machine efficiently after a few hours' training.

Fast, rubber-tired pusher — Because of quick spotting ability, 8 mph reverse speeds, and instant speed selection, Schweitzer Constr Company's Tournatractor-pusher easily keeps 2 C Tournapulls "humping" on short cycles. With "C's" on long hauls, 186 hp tractor uses waiting time to clean cut, grade haul road, fill sink-holes. Rigs land-level year around near Lake Arthur, N.M.

Peels wet kaolin — Stockpiled kaolin comes up in sheets when dozed to mill near Macon, Georgia, by Edgar Brothers' Tournatractor. Rig has plenty of traction to move 2½ yd loads, despite slippery footing. "It really does the work," says Superintendent James Langford. "It has plenty of power." Note excellent condition of tires after more than 6000 hours of use.

Maneuverability pays off — A copper mine in Arizona reports their one 50-ton and two 40-ton Tournapull Rear-Dumps haul 27½ to 35-yd loads of rock and common earth up continuous 12% grades from pit to dump . . . average a 1.2 mile cycle every 12⅓ minutes. Fingertip electric controls, 4-wheel multi-disc air brakes and 90° power steer make for safe travel on this difficult route. Operator R. G. Galloway comments, "I like the fingertip controls a lot better than the shift lever type. It's easier to steer getting out of tight places." For more information on tools shown on these pages, write LeTourneau-Westinghouse Company, Peoria, Ill.

Tournapull—Trademark Reg. U.S. Pat. Off. Tournatractor—Trademark Pic-646-G



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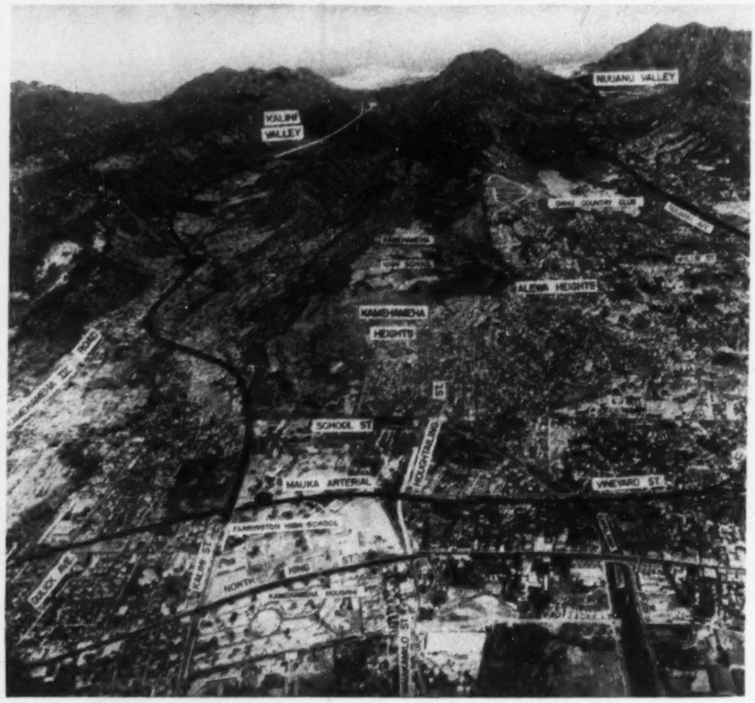


TWO ROUTES through the mountains are progressing near Honolulu (foreground).

Hawaii builds mountain highways—feature realignment and tunnels

Back in 1852, when Hawaii was known merely as a haven for whaling ships and trading vessels, an islander who called himself "Friend of Good Roads" penned a letter.

The people of the island of Oahu, he said, would never be satisfied until there was a tunnel built through the Koolau Mountains "for carts and wagons."

Now, 102 years later, with the island known widely as the site of Pearl Harbor, the city of Honolulu and Waikiki Beach, the islander's dream comes to reality.

But it took a bitter highway fight to bring it about, and even now, as crews are blasting their way under the mountain, some skirmishes are still being fought.

• **The problem**—A modern highway is needed to connect the city of Honolulu with the growing suburbs that lie across the steep Koolau Mountains. The only present routes are a long highway around the mountain range, and a narrow, winding road over the mountain. It was built at the end of the 19th century.

A debate over alternate routes developed into a No. 1 political issue after World War II.

One side, armed with statistics to show that its route would carry more traffic and serve more people, was the Territorial Highway Department, backed by the Federal Bureau of Public Roads. It favored improving the 19th century road, expanding it into a four-lane divided highway with whatever tunneling might be necessary.

On the other side, was the city-county government of Honolulu, with its claim that the 19th century road, with minor improvements, was good enough. The thing to do, it contended, was open an entirely new route to the northwest, thus opening new lands to the public and providing an alternate route, shorter for some areas, including the Pearl Harbor-Hickam Field military bases.

This, apparently, was the more popular plan, for its main advocate, John H. Wilson, now 82, was successively reelected mayor in 1946, 1948, 1950 and 1952 with his promise to open this route as his main campaign slogan each year.

It is perhaps incidental that Wilson

—opposed to any major changes in the old route—helped to build it in 1897-98 as a young contractor at a cost so low ($37,500) that others predicted (incorrectly) he would lose his shirt.

The fight, waged in courts, legislature, and on the stump, succeeded only in stopping progress on either route until Hawaii acquired a new governor, Oren E. Long, in 1951.

• A solution—"Build both routes," Long said, and ordered his highway department to cooperate on the city-favored route as well as its own and helped get federal aid for both.

Despite a change in administration, the present governor, Wilder King, stuck to the "build both" policy of his predecessor, and the chips soon began to fall into place as approach roads got under way.

In January, dynamite crews set their first charge for a tunnel in the city-favored second route in Kalihi Valley. Two lanes (29 ft) wide, 2,773 ft long, with a 15-ft height, the tunnel will be provided with interior lighting and exhaust ventilation.

Alarm signals will shut down traffic through the tunnel if the concentration of carbon monoxide reaches four parts in 10,000. Special graduated lighting precautions will be taken to help motorists adjust their eyes on entering and leaving.

In addition to the tunnel section, about four miles of approach road will be financed by the city out of a $6-million general obligation bond issue.

Another 2.8 mi of approaches will be built by the territory with the use of federal aid funds at a cost of $2.5 million.

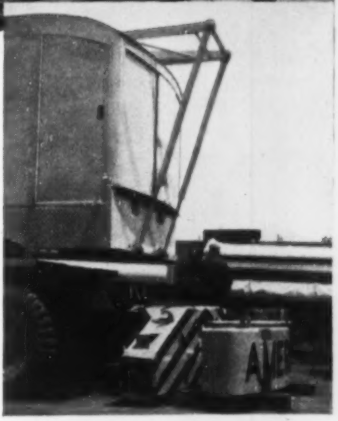
A second bore is planned for later, but until that is added, traffic in the tube will be two-way and may be held to 10 mph at times by trucks as they climb the 6% grade. Normally, however, speeds of 25 mph are expected to prevail most of the time.

The overall route distance will be 7.4 mi between points that now are about 12 mi apart by the closest routing.

• Some progress already—Meanwhile, the Territorial Public Works Department is proceeding step-by-step with its replacement of the 56-year-old road through Nuuanu Valley, keeping it open to traffic while work progresses. A 1.28-mi segment of this routs was completed during 1953 in which 22 turns were eliminated by means of a single large horseshoe.

Both tunnels may be bid this year,

(*Continued on page 56*)



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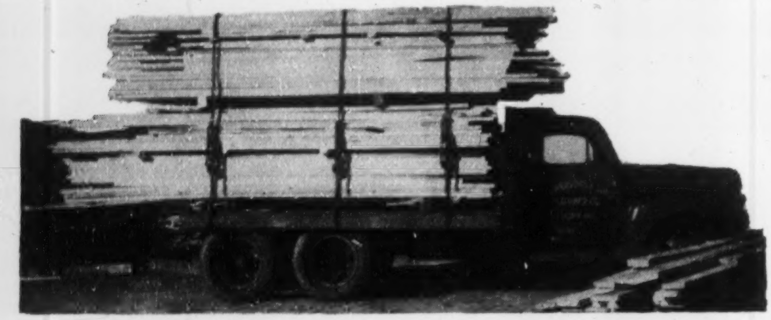

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a 1,000-ft one near the top in mid-year, a 400-ft one late this year. They will be concrete lined and lighted, but ventilation will be by vehicular movement.

Each will be two lanes wide and carry only uphill traffic, because in that sector the existing road will be preserved to carry one-way downhill traffic.

The improvements will replace 5.6 mi of winding road with grades up to 12% with a 4.2-mi highway with maximum grades of 6%. It is estimated the driver who could traverse the old road in 16.3 minutes will navigate the new one in 6.3.

Total cost of improving the Nuuanu road will approximate $8 million, depending upon the outcome of arguments still unsettled as to its route through the built-up section of Honolulu. Several years will be required for completion, but the route will remain open for traffic at all times.

• **Kalihi tunnel**—The city's tunnel in Kalihi Valley should be holed through by June, 1954, but road finishing may take until mid-1955 before the route is open to traffic.

Even then, access will be over narrow existing streets until the 2.8 mi of federal aid approach are complete. Territorial officials say they are delayed in starting on this by the city's slowness in providing for local access roads which are a prerequisite of the federal aid.

The territory says the job that will take a year and a half, once started, could be completed by late 1955. The city responds that the preliminary work will be cleared away in a matter of weeks. And while this might seem to settle the long debate, it isn't over.

Wilson still advocates abandoning the Nuuanu route, declaring that it will be little more than a "private lane" once the tunnel bearing his name is open and in use. He is supporting a taxpayer suit aimed at stopping approach work on one sector of the route because of objections to the alignment.

Territorial officials say that the suit challenges the right of the government to condemn land for road-building, and since you can't build roads without condemnation, not only the territory but the city, too, will be out of the road-building business if the suit is successful.

The fighting goes on—and so does the road building—with litigation due to affect only those portions of the program yet to be placed under construction.

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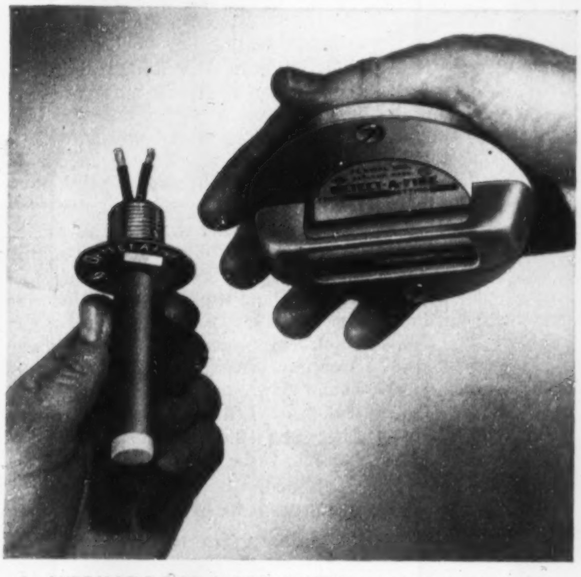

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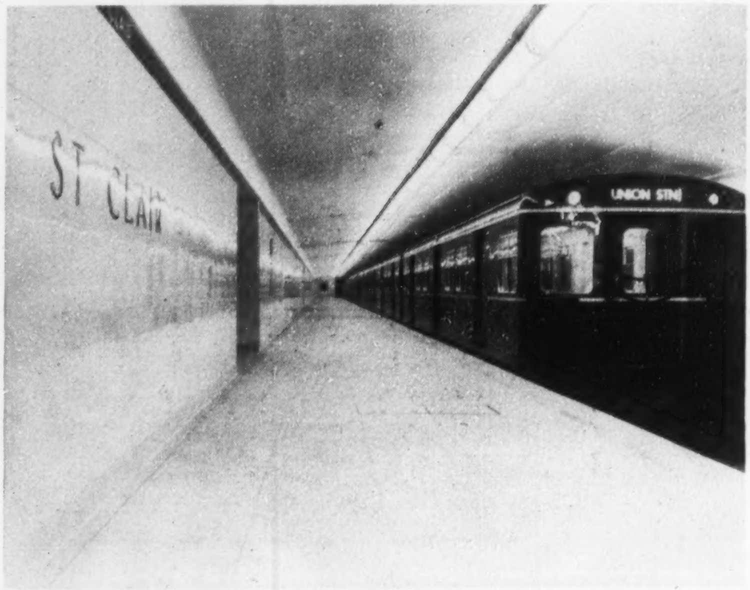

SUBWAY STATION, in Toronto, Canada, features an unobstructed 500-ft station platform for full access to the trains. Columns are between north and south-bound tracks.

Toronto to open first Canadian subway

Canada's first underground rapid-transit system opens at Toronto next week (ENR March 5, 1953, p. 25; Dec. 17, 1953, p. 37). Covering a 4½-mi route, mostly underground but partly in open-cut, the subway was built in 4½ years for $50 million.

Comfort of the 40,000 passengers the line is designed to carry has been carried to the extent that station ceilings are lined with acoustical tile as are the lower portions of the subway tunnel walls. To cut the noise of trains still more, a rubber mat separates the concrete slab floor of the tunnel from the fastening plates of the rails for the subway trains.

In the stations, pillars are eliminated except between the north-bound and south-bound tracks so that full access to the side of the trains is given from all points of the station floor. Station lighting is provided by one continuous strip of fluorescent lamps running the full length of the 500-ft long stations. Each station is easily identified by varying color schemes and the usual station signs.

The route runs under Yonge Street, Toronto's main north-south thoroughfare, and a station for a future east-west route on Queen Street has been built under the Yonge Street subway at the intersection of Queen and Yonge Streets.

Safety features on the subway include a railway-type block signal system, and an electronic automatic despatching system with a punched tape which can carry a complete day's schedule. The tape can be cut out to allow for manual control of the system.

Design of the system was carried out by the Toronto Transit Commission headed by W. H. Paterson, chief engineer, and the Chicago engineering firm of De Leuw, Cather & Co. Contractors comprised a Canadian-American syndicate of Pitts, Johnson, Drake & Perini, Ltd., Rayner Construction, Ltd., Mannix-McNamara, Ltd., and the Foundation Co. of Canada, Ltd.

Quebec lake-drainage plan clears way for mining job

American Smelting & Refining Co. will finance a $20-million scheme for draining Black Lake in the Province of Quebec. The project's purpose is to uncover a series of asbestos deposits—reportedly the world's largest—for open-pit mining operations.

Plans already accepted by Quebec authorities call for controlling dams and creation of an artificial lake about 1½-mi downstream.

The U. S. firm will work jointly

with United Asbestos Corp., Ltd.—the Canadian company that started the development and carried it to the stage where more than three miles of underground workings were completed.

While the deposits are explored only partially, at least 50,000,000 tons of ore have been confirmed below the waters. The first mill to be erected on the site will have a capacity of 5,000 tons per day.

Canada supplies 70% of the free world's asbestos requirements, and most of this output comes from this same small Black Lake section of Quebec close to the Vermont border.

Square hole drilling used on Canadian bridge piers

Square hole drilling was used extensively in the erection of the new $16.5-million Granville Bridge in Vancouver, B. C. Reportedly this is the first time the operation has been used in Canada.

Dominion Bridge Co., Ltd., Vancouver, used this new method for drilling holes in the pier members of the bridge because the square holes would take the teeth of the locating pinions forming part of the expansion joints.

Square holes can be drilled either vertically or horizontally by means of a special drill that is adaptable to standard drilling machines or lathes. For the bridge job, the holes were made $1\frac{9}{16}$-in. sq, with a corner radius of $\frac{1}{16}$-in. They were drilled in a $3\frac{5}{8}$-in. thick plate to a depth of $2\frac{1}{8}$-in.

For the complete story of the construction of the Granville Bridge, see ENR Feb. 18, p. 196.

International briefs . . .

- **Partnership in Punjab**—Pakistan and the U.S. will team up on a $30-million irrigation project in Punjab province—construction of a mile-long diversion dam across the Indus River at Taunsa (near the district capital of Dera Ghazi Kan). Under the agreement, the U. S. will contribute $3.5 million toward the initial work and Pakistan, $9 million.

- **Electrification expense** — The first stage of Venezuela's program for electrification of Caroni Falls will cost $33 million. This outlay—covering the first three years' activity—will pay for preliminary installations to generate 150,000 kw.

Timber Bridge Carries 100 Ton Load...

Bridge of J. Neils Lumber Co., Libby, Montana, consists of 155-foot center span and two side spans of 152 feet plus approaches. Truss members and floor beams are glued laminated timbers, fabricated to engineering detail, creosoted and assembled in place. Decking is longitudinally laminated planking. All metal hardware is galvanized.

This bridge, which required only six months for engineering, fabrication and erection, is designed to carry 100-ton loads of logs and equipment and to last for 75 years. It is typical of the ability of Timber Structures, Inc. to provide engineered structures at moderate cost and for long, hard service. It points the way to significent savings and minimum maintenance for private and publicly owned bridges.

Timber bridges are available in several types to fit varying conditions of service and site location. For detailed information, ask your nearest Timber Structures representative for the new booklet, "Timber Bridges", or write us direct.

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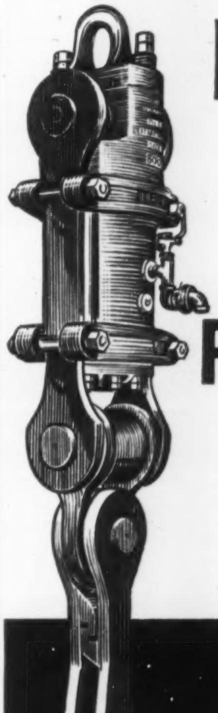

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Fairless Works of United States Steel Corporation's plant at Morrisville, Pa., on the Delaware River, is the country's largest single steel construction project undertaken at one time. Waterproofing done by Lewis and McDowell, Inc., New York City.

When permanent waterproofing was wanted on the foundation of U. S. Steel's new "Fairless Works," Karnak was chosen by the contractor. The world's most modern steel mill called for the best in all materials. That's why 750,000 yards of Karnak were used to protect against water, wherever there was a hydrostatic head.

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The secret to the extreme water resistance is the Karnak Membrane Fabric. Open Mesh Cloth, specially woven of long-fiber cotton is carefully saturated with highly refined asphalt so as to leave the mesh open. When this fabric is layered on the job with alternate moppings of liquid asphalt, it provides a tough, thoroughly waterproof membrane that resists cracks, abrasion and settling to maintain water resistance through the life of the structure.

The Karnak system is also the best for roof patching, skylight flashing, window and door flashing, through-wall and cornice flashing, as well as waterproofing against a hydrostatic head in dams, swimming pools, viaducts and tunnels...***Lewis Asphalt Engineering Corp., 30 Church St., New York 7, N. Y.,***

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OBITUARIES

Rudolph Warner Van Norden, 78, consulting engineer who designed 30 hydroelectric plants and served as technical adviser on Hoover Dam, died Mar. 9 in San Francisco. He was an expert on arched and multiple arched dams and is credited with designing some 50 of them. From 1897 to 1905 he served as chief engineer and general superintendent of Central California Electric Co., Sacramento.

Thomas L. Wakefield, 30, of Boise, Idaho, a civil engineer, died March 4. He was a civil engineer with the Bureau of Reclamation's regional office.

C. A. Inskeep, 70, right-of-way engineer of Division 7 of the Ohio State Highway Department and former Logan County engineer, died at Bellefontaine, Ohio, March 10.

Charles A. Readinger, of Cleveland, Ohio, for 13 years an international representative of Michael Baker, Jr., Inc., of Rochester, Pa., died in Amman, Jordan, March 5.

Harold Wangen, 57, former Bureau of Reclamation engineer, who in recent years has served as secretary for the Montana Greenfield Irrigation Project, died in Great Falls, March 2.

Walter L. Leach, 53, partner in Havens & Emerson, New York and Cleveland, died March 5 in West Orange, N. J. A graduate of Ohio State University in 1920, he began work in the engineering department of Cleveland's subdivision of sewage disposal. In 1922 with the late G. B. Gascoigne he opened an engineering counsel office, and he was with that firm and its successor, Havens & Emerson continuously, except during the first World War when he was chief engineer in the water works division of the War Production Board, Washington.

Harold K. Barrows, 80, professor emeritus at Massachusetts Institute of Technology, and an authority on hydraulic engineering, died at Winchester, Mass., March 15. He was an 1895 C.E. graduate of M.I.T. After work with the Metropolitan Water Board of Boston he was on the faculty of the University of Vermont for three years. In 1904-08 he was district engineer for the U. S. Geological Survey in New England and New York. Professor Barrows joined the hydraulic engineering department of M.I.T. in 1909 and retired in 1941. He wrote many books on hydraulic engineering.

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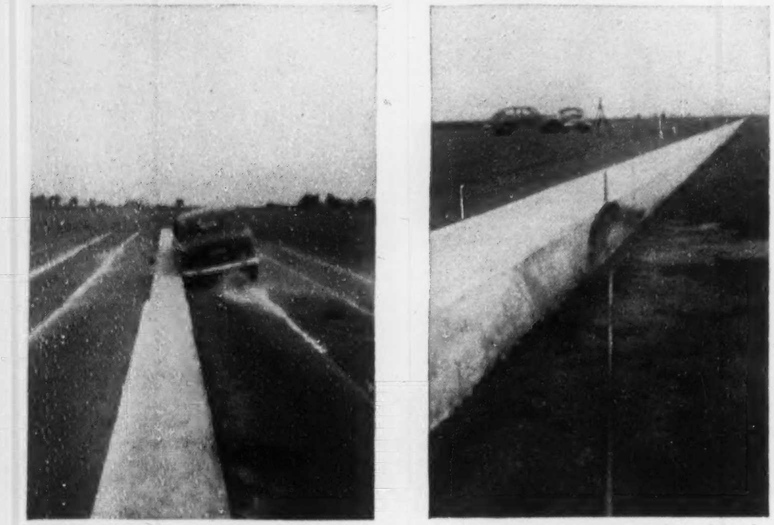
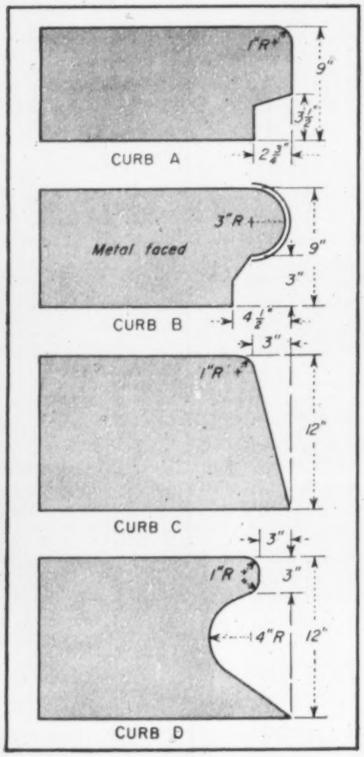


RAMMING THE TEST CAR into various curb types at established speeds and angles (note guide tape on ground) furnished information on braking action, barrier efficiency and auto damage. Imprints from painted tires gave evidence of mounting characteristics. Four curbs (right) out of eleven tested were reported favorably.



Barrier curb design compared

With the aid of a professional test driver who tooled a test auto with the disregard for life and limb usually attributed to garden-variety California drivers, the Materials and Research Department of California's Division of Highways has been conducting a series of tests on eleven barrier curb designs.

In general it may be said that the undercut type of curb is most efficient as a barrier, but conclusive data has not been developed on the question of most efficient dimensions and type of facing materials.

According to the department, "the primary objective of the investigation was to determine the ability of various types of curbing to serve as a physical barrier to cars striking the curb and also to determine the potential damage to both car and curb."

Of those tested, four designs were reported favorably. At angles of collision of 5, 10 and 15 deg, Curb A proved to be overall the most effective type. This curb not only prevented climbing at these angles but also served as an external brake on the forward motion of the car. This latter action also caused the post collision travel of the car to be close in and parallel to the curb. Mounting of this curb was found to be relatively easy at 20 deg and higher angles of approach.

Curb B, the metal-faced, round-nosed, undercut curb, was more efficient than Curb A when considered only as a barrier. But there are two drawbacks in that it brakes the vehicle insufficiently and there is a "tripping" action of the vehicle at higher speeds. The lack of retarding action of this curb resulted in the test car ricocheting off at an angle and speed nearly equal the approach angle and speed of the test. The vehicle did not mount or even partially climb this curb at any time during the test; however, any further increase probably would have resulted in an overturn of the car.

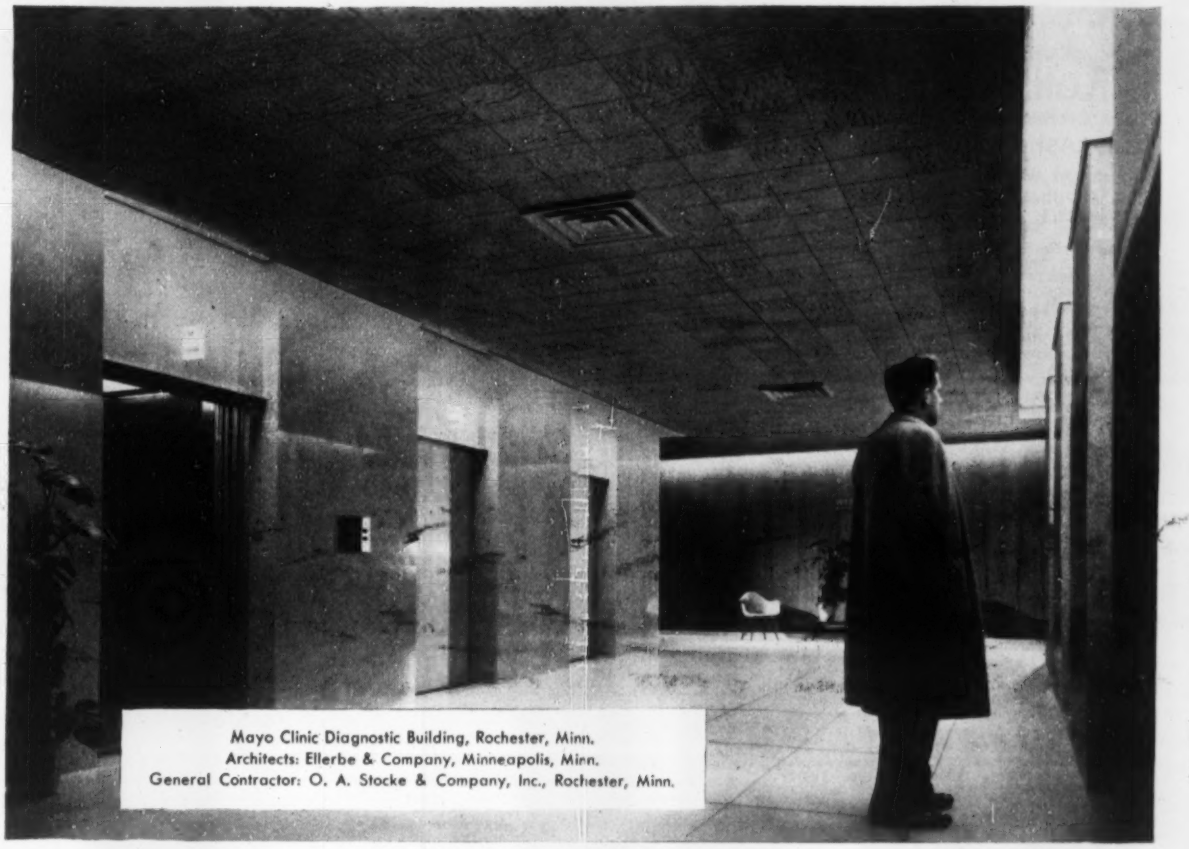
The two 12-in. high test curbs—C and D—also proved to be effective barriers, but neither had the braking effect of Curb A, nor was it any more effective as a barrier than B. There was an indication from the modified ogee-shaped Curb D that a rail located at hub center height may be most effective as a barrier. However, such a rail probably should be armored to withstand the collisions and resist the biting action of the rim. The major drawback of the 12-in. height was found to be that it will contact the body of a modern car on each collision thus causing additional type of damage to the automobile.

The effect of height was reasonably demonstrated during this test. It is obvious, of course, that any obstruction placed below the center of mass of a vehicle will cause overturning upon collision. The tests seemed to indicate that for the modern car the center of gravity is in such position and the construction of the car such that within the usual operating speed ranges it is difficult to cause overturn on collision with a 9- or 10-in. high curb.

There is more of a tendency to overturn when the front colliding wheel folds under contact. The action of the 12-in. high ogee Curb D compared with Curb B indicates that a contact point at the hub cap would be most effective to prevent the wheel from folding under the car and would act as a barrier for most collisions.

It is hoped that the results of the tests can lead to the development of a composite curb offering the best qualities of those reported. Testing of a curb design combining the upper half of Curb B and the lower half of Curb A—a potentially ideal curb—was recommended.

The test program was supported by the California Highway Commission under the direction and supervision of F. N. Hveem, materials and research engineer; J. L. Beaton, supervising highway engineer and H. A. Peterson, Jr., assistant physical testing engineer.



Mayo Clinic Diagnostic Building, Rochester, Minn.
Architects: Ellerbe & Company, Minneapolis, Minn.
General Contractor: O. A. Stocke & Company, Inc., Rochester, Minn.

QUIET: Good for what "ails" a Clinic

When Mayo Clinic, Rochester, Minn., chose Acousti-Celotex tile to sound-condition its beautiful new Diagnostic Building—it hit upon the most economical, attractive, lowest-cost way possible.

For here was an example-in-use of efficient materials with high sound-absorption value . . . *plus* quick and easy installation, and minimum maintenance . . . *plus* magnetic eye-appeal that blended harmoniously with the established decor.

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In the total 187,175 square feet of acoustical treatment given the Diagnostic Building, a variety of Acousti-Celotex tile types were utilized to meet specific needs. Where frequent cleaning was an important factor, Acousteel was installed. To answer the essential purpose of *washability* and *paintability* . . . Acousti-Celotex Perforated Mineral Fiber Tile. And Celotone®, an incombustible fiber tile with rich, deep, sculptured effect, proved the ideal solution in every instance requiring smart decoration. All tile is white, except for areas such as the beautiful elevator lobby pictured above. This was spray-painted green.

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M E SCIORRA, F S. DEMBEK, Reports.
J. H. WEBBER, M R. ROESSLER, E R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

Mass., Boston—B.A. 4/8—Commonwealth of Mass., Metropolitan Dist. Comn., 20 Somerset St., Contr. 210, constr. Boston Main drainage tunnel of South Metropolitan Sewerage Dist. from proposed site from Shaft A near Ward St. pumping station in Roxbury to Shaft C on Deer Island, consists of sinking and lining Shaft A at Ward St., Shaft B at Columbus Park and excav. and lining about 2½ mi. of 10 ft. finished inside diam. tunnel between Shafts A and B and 4½ mi. of 11½ ft. finished diam. between Shafts B and C to serve South Metropolitan Sewerage Dist., other appurtenant work, Shafts A and B will be approx. 14 ft. in diameter and final linings will be 10 and 9 ft. diam. respectively. Plans deposit $15. Frederick W. Gow, ch. engr. CD 1/15/52.

SOON LETS CONTRACT—BUILDINGS

Mass., Wellesley—SCHOOL—St. Paul's Parish, 502 Washington St., soon lets contract, 2 story, bsmnt., 58x133 ft., brick, steel, concrete parochial school, Atwood St. CD 11/24.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MAINE**—Maine Turnpike Auth., 17 Bishop St., Portland,

The Savin Constr. Corp., 10 Village St., East Hartford, Conn. CA **$1,745,506.** Contrs. 204A-204B, Sect. 2 grading, drainage, Augusta Exten., Falmouth, Gray and Cumberland. CD 3/10, under LB.

▲† **Arthur Venneri, Co.**, 300 North Ave., East Westfield, N. J., LB **$1,689,000,** AC and troop supply warehouse, refrigerated warehouse and commissary and aircraft shops, Portsmouth Air Force Base, ENG-19-016-54-65, PORTSMOUTH, N. H. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Mar. 5. CD 2/3.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

A. V. Taurasi, Jacques St., Somerville, Mass. LB **$4,449,538,** est. $5,000,000. U-229 (6) hy. and bridge, Dedham, Westwood, Needham;

D. V. Frione & Co., Inc., 87 Foxon St., New Haven, Conn. LB **$2,398,842,** est. $2,225,000. F 344 (4) hy. constr. Amvets Memorial Hy., Brockton;

Hill Constr. Co., Providence St., Millbury, Mass. LB **$249,542,** est. $270,000. S 90 (4) hy. Rte. 68, Hubbardston. Bids Mar. 9. CD 2/17 and 2/25.

BUILDINGS

LOW BIDS AND CONTRACTS

Wadhams & May Co., 15 Lewis St., Hartford, Conn., CA **$700,000,** 2 story BANK addn., 31 Pratt St., HARTFORD, CONN. Society of Savings, 31 Pratt St., Hartford, Conn. CD 7/17.

▲ **Dwight Building Co.**, 152 Temple St., New Haven, Conn., CA, **$2,000,000,** MEDICAL SCHOOL and DORMITORY, Oak, Davenport, South and York Sts., NEW HAVEN, CONN. Yale University, New Haven, Conn. Bids March 4. CD 2/24.

Lyndall Development Corp., c/o David Einbinder, 40 Hawthorn St., Manchester, Conn., Owner Builds, **$850,000.** HOMES, East Robbins Ave., NEWINGTON, CONN.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

Pa., Phila.—B.A. 4/7—Dpt. Procurement, Water Dpt., City Hall Annex, Bid No. 2138, Contr. No. 601-W, furnishing labor, materials, equipment and accessories for making all alterations, addns. to existing pumping station, demolition of existing structures, removal and disposal of existing equip., piping and facilities, constr. complete all addnl. structures, incl. alterations; furnishing, installing auxiliary equip. and appurtenances in connection with the electrification of present Queen Lane Pumping Station. Plans deposit $25. CD 8/9/46.

▲† **N. Y., Fort Tilden**—ANTI-AIRCRAFT FACILITIES—B.A. 4/13—U. S. Eng., 80 Lafayette St., New York Zone 13, anti-aircraft facilities, Serial No. Eng. 30-075-54-211. $1,000,000. Plans deposit $100.

Pa., Erie—B.A. 4/20—Erie Sewer Auth., City Council Chambers, Erie, Sect. 1, general constr., major equipt. and process piping; Sect. II, electrical; Sect. III, plumbing; Sect. IV, heating; Sect. V, ventilating for constr. of addns. to existing City of Erie Sewage Treatment Plant. Plans deposit $80. Fred A. Gorenflo, city engr. Consoer, Townsend & Assocs., 351 E. Ohio St., Chicago, 11, Ill., and 717 Liberty Ave., Pittsburgh, Zone 22, consult. engrs. CD 7/28.

BIDS ASKED—BUILDINGS

▲**N. J., Trenton**—SCHOOL—B.A. 4/1—Ewing Twp. Bd. Educ., Parkway, Elementary and Junior High School, Redd Ave. and Upper Ferry Rd. $1,750,000. Micklewright & Mountford, 72 Ewing St., archts. CD 7/14.

▲ † **N. J. Fort Hancock**—ANTI-AIRCRAFT FACILITIES B.A. 4/14—U. S. Eng., 80 Lafayette St., New York 13, N. Y. anti-aircraft facilities at Fort Hancock, Sandy Hook Serial No. Eng-30-075-54-212, $1,000,000. Plans deposit $100.

N. J., **Trenton**—HOUSING—B.A. 4/14—Trenton Housing Auth., 875 New Willow St., housing, Mellon and Eisenhower Sts. $800,000. Mickleweight & Mountford, 72 Ewing St. archts.

▲ **Pa., Harrisburg**—PRISON—B.A. 4/14—Dauphin Co. Comn., Court House, county prison bldg., 27th St. and Rte. 422 at site of county home, $1,500,000. Plans deposit $50. Lawrie & Green, 321 N. Front St., archts. CD 11/10/52.

▲ **D. C., Wash.**—HOUSING—B.A. 4/15—National Capitol Housing Auth., 1729 New York Ave. N.W., Section 2, Housing Project DC-1-18, East Capitol Dwellings, 186 dwelling units at East Capitol St. and 58 Sts. S.E. $4,787,920. Plans deposit $30. William F. R. Ballard, 123 E. 77 St., New York, N. Y., archts. CD 7/2.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Jones Beach State Parkway Auth., Belmont Lake State Park, Babylon,

Hendrickson Bros., Inc. 63 N. Central Ave., Valley Stream, N. Y. CA **$5,077,000.** Contr. 6 Southern State Parkway Imprvt., Nassau Co. Bids Feb. 9. CD 2/12, under LB.

▲ **Associated Constructors**, Maplewood, N. J. and **H. W. Alward, Inc.**, 161 Mount Airy Rd., Bernardsville, N. J. CA, Est. **$1,500,000.** 38,000 ft. 48-in. pipe line from Piscataway Twp. to Oak Tree, Raritan Twp. and 4,400 ft. of connecting 36 in. pipe line, NEW JERSEY. Elizabethtown Water Co., 22 West Jersey St., Elizabeth 4, N. J. Lock Joint Pipe Co., 150 Rutledge Ave., Orange, N. J., will furnish rein.-con. pipe. CD 1/14.

† **Gasparini Excavation Co., Inc.**, 1439 Main St., Peckville, Pa., LB **$535,000.** Swoyersville-Forty Fort Flood Protection Proj., Levee Unit No. 2 at Swoyersville-Forty-Fort, Luzerne Co., Serial No. CIVENG-18-020-54-27, PENNSYLVANIA. U. S. Eng., 24 St. and Maryland Ave., P.O. Box 1715, Baltimore 3, Md. Bids Feb. 10. CD 2/8.

▲ **MARYLAND**—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

W. E. Graham Constr. Co., Cleveland, O. LB **$1,159,516.** grading, drainage, surf. 2.64 mi. relocated U. S. Rte. 240, near Gaithersburg, Contr. M 485-3-320, Montgomery Co. Bids Mar. 9. CD 2/25.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Melwood Constr. Corp.**, 507 Fifth Ave., New York 17, N. Y. CA **$2,609,000.** foundations and appurtenances for Bay View HOUSES, Proj. NYC 24, in area bounded generally by Seaview Ave., E. 102 St., Shore Parkway and Rockaway Parkway, excluding northerly portion of area generally bounded by Seaview Ave., E. 102 St. Skidmore Ave., E. 100 St., BROOKLYN, N. Y. New York City Housing Auth., 64 Park Row, New York 38, N. Y. Bids Feb. 10. CD 2/12, under LB.

John W. Rouse Constr. Corp., 8 Church St., Gouverneur, N. Y., CA **$983,497,** general constr. Junior-Senior HIGH SCHOOL, BURNT HILLS, N. Y. Bd. Educ., Burnt Hills, N. Y. Bids Jan. 22. CD 1/8.

▲ **Cedar Hollow, Inc.**, 1217 Old York Rd., Abington, Pa. Separate Contracts. **$1,200,000.** RESIDENTIAL DEVELOPMENT, ABINGTON, PA.

▲ **Baton Constr. Corp.**, 1717 Sansom St., Phila., Pa., CA **$1,378,200.** Senior HIGH SCHOOL, BERWYN, PA. Paoli Area School Auth., Berwyn, Pa. CD 2/5.

▲ **Anchor Concrete Co., Inc.**, 1011 Pontiac Rd., Drexel Hill Pa., Separate Contracts. **$1,540,000.** RESIDENTIAL DEVELOPMENT, Richmond Rd., BROOMALL, PA. Erling Wenge, McClatchy Bldg., Upper Darby, Pa., archt. Damon & Foster, Sharon Hill, Pa., engrs.

▲ **Edwin E. Hollenback**, 5624 Vine St., Phila., Pa., CA **$1,299,746.** Wm. Penn Junior HIGH SCHOOL, Fairless Hills, FALLSINGTON, PA. Falls Twp. School Auth., Fallsington, Pa. Bids Feb. 25. CD 3/8, under LB.

▲ **Turner Constr. Co.**, 1500 Walnut St., Phila., Pa CA **$1,500,000.** department STORE and parking area. PHILA., PA. Lord & Taylor Div. of Associated Dry Goods Corp., 366 Fifth Ave., New York, N. Y. CD 10/29.

▲ **Pa., Hillside Development & Constr. Co., Inc.**, 8100 Bustleton Ave., Phila., Pa., Separate Contracts. **$1,000,000.** RESIDENTIAL DEVELOPMENT, Churchville and Southampton, SOUTHAMPTON, PA.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **Fla., Panama City**—QUARTERS—B.A. 4/1—U. S. Eng. P.O. Box 1169, Mobile 7, Ala. 5 cadet barracks bldgs. converted to bachelor officers' quarters, Tyndall Air Force Base. CD 11/12.

BIDS ASKED—BUILDINGS

† **S. C., Charleston**—RECREATION—B.A. 3/30—Dpt. Navy, P. Wks. Officer, Naval Base, Charleston, renovating to Eliza Lucas Hall, Recreation Bldg., NOY 41545. Plans deposit $10. CD 9/17/51.

▲ **Fla., Miami**—HOUSING—B.A. 3/31—Miami Housing Auth., 327 N.W. 62 St., 250 housing units, $2,000,000. Plans deposit $75. CD 6/19/52.

▲ **Ga., Clarksville**—SCHOOL—B.A. 4/1—Habersham Co. Bd. Educ., Clarkesville, high school $500,000; elementary-high school Cornelia, $500,000. CD 8/27/52.

▲ **Va., Hornsbyville**—REFINERY—Pan American Refining Corp., 122 E. 42 St., New York, N. Y., and 134 26th St., Newport News, Va., bids in about two months from selected list of bidders, oil refinery and by-products plant. $25,000,000. CD 9/21.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **FLORIDA**—State Road Dpt., Tallahassee,

Broward Asphalt Corp., Box 940, Fort Lauderdale, Fla., LB, **$87,491,** 7.409 mi. State Rd. 60, Job 8806-114, Indian River Co.; LB **$81,989** 8.951 mi. State Road A-1-A, Job 9306-115, Palm Beach Co.;

W. L. Cobb Constr. Co., Box 977, Tampa, Fla., LB, **$74,141.** 5.937 mi. State Road 605, Job 8803-107 Indian River Co.;

Coffee Constr. Co., Eastman, Ga., LB **$241,516,** 6.493 mi. State Rds. 25 and 100, Job 3201-115 Hamilton Co.; 4.753 mi. State Rd. 25, FI-002-3 (7) Job 3201-206, Hamilton Co.;

Macasphalt Corp., Box 627, Lakeland, Fla., LB, **$71,534,** 6 mi. State Rd. S-634, Job 0963-150 Highlands Co.;

Troup Bros., Inc., Box 168, Miami, 33, Fla., LB, **$137,176** 8.3 mi. State Rd. 5, Job 8701-103, Dade Co.;

Jay W. Craig Constr. Co., 1914 California St., Minneapolis 33, Minn., LB, **$270,946** 15.185 mi. State Road 25, Job 8709-107, Dade Co.;

Faulk & Coleman Constr. Co., Tallahassee, Fla., LB **$194,526,** 7.528 mi. State Rd. 30, Job 5703-114, Okaloosa Co.;

Smith Eng. Constr. Co., P.O. Drawer, 1831, Pensacola, Fla., LB, **$96,472;** 21.274 mi. State Road No. 10 Job 6001-108, Walton Co.;

Duval Eng. & Constr. Co., Box 1588, Jacksonville, Fla. LB, **$90,508, 16**.806 mi. various county roads Job 7250-167, Duval Co.;

Acme Constr. Co., Cochran, Ga., LB, **$83,092** 12.241 mi. State Rd. 46, Job 7703-105, and State Rd. 419, Job 7707-105, Seminole Co.;

J. D. Manly Constr. Co., Box 586, Leesburg, Fla. LB, **$342,855,** 8.562 mi. State Rd. 35, Job 1405-111 and 0803-103, Pasco and Hernando Counties;

Rich Constr. Co., Box 149, Tallahassee, Fla., LB **$190,035,** 6.76 mi. State Rd. 30, Job 5101-109, Gulf Co.;

Georgia-Alabama Paving Co., Box 367, Columbus, Ga. LB, **$122,943,** 25.531 mi. State Road 53, Jobs 3305-103 and 3506-108, Lafayette and Madison Counties;

(Continued on page 66)

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects invloved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
B.A.	**Bids Asked**
ENR	**Engineering News-Record**
CD	**Engineering News-Record Construction Daily**

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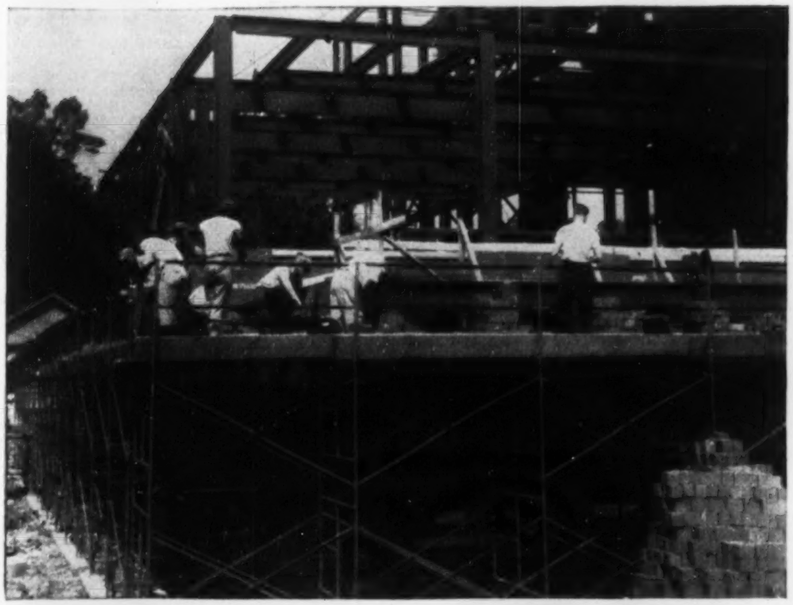
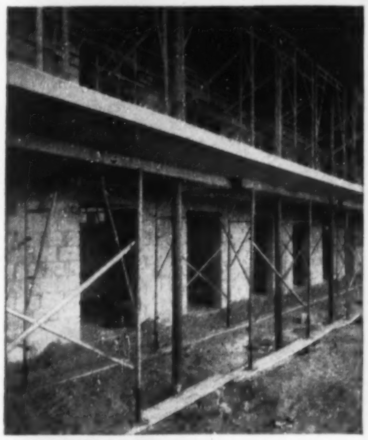
This Prefabricated Steel Scaffolding Serves Four Construction Trades



NEW YORK MASONS

work on new power plant building at the State Hospital in Middletown, N. Y. L. B. Strandberg and Sons Co., Inc., Chicago general contractor, purchased the "Trouble Saver" Sectional Steel Scaffolding used on this job. The 5-ft high mason-type frames shown here in use are designed to provide a convenient, multi-level scaffold with a maximum number of sidewall bracket positions for masons' use. "Trouble Saver" Scaffolding, described in free Bulletin PSS-24, is one of the many types of scaffolding offered by PS Co.—the only complete line for every job, big or small. Be sure of the right equipment for your job — follow the practice of experienced contractors and—*when it comes to scaffolding, come to PS.*

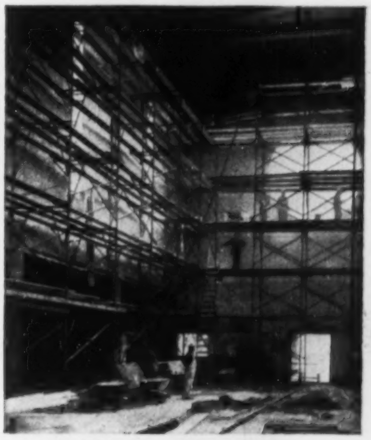


MIAMI SHORES—

For the Blue Horizon Hotel's new cabanas, Florida contractor Morris Burk cut concrete shoring costs by using "Trouble Saver" Sectional Scaffolding and I-beams set directly on scaffolding frames. Plywood panels were laid on I-beams without fastening. The new technique eliminates framing, also ends stripping. "Trouble Saver" Scaffold used: 52 5x5-ft deep-trussed end frames, 20 6½-ft shallow-trussed end frames, 72 6½-ft deep-trussed end frames, 288 plain bases, 288 20-in. adjustable extension legs; 120 5-in. I-beams.

RENOVATION IN ILLINOIS—

Removal of old cornices, installation of new stone copings and a new synthetic granite front, replacing of windows and painting the upper floors of the 8-story building at 12-22 North Michigan Ave., Chicago, required this big "Trouble Saver" Scaffold. To erect the 92-ft high scaffold, The Patent Scaffolding Co.'s Chicago office supplied 315 pre-fabricated scaffold frames to Enjay Construction Company. Here workmen are removing the old cornice preparatory to installing a simple stone coping.



PORTLAND PLASTER

contractors Cann & Gray rented this five-level "Trouble Saver" Sectional Steel Scaffolding structure to safely speed plastering of a new church at S. E. 18th and Division Streets in Portland, Ore. This "Trouble Saver" assembly employed shallow-trussed end frames, 6½ ft high, giving workmen ample headroom when walking along the scaffold platforms. Also note the "Trouble Saver" Scaffolding sidewall brackets, employed here for extra platform working area for plasterers.

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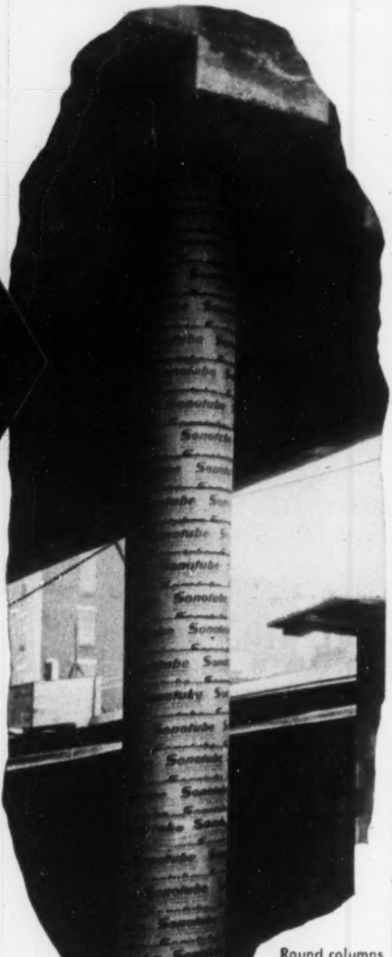

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(Continued from page 64)

Marion Constr. Co., Ocala, Fla., LB, **$613,327** 17.233 mi. State Rd. 40, Job 3608-107 and 1114-105 Marion and Lake Counties. Bids Mar. 9. CD 2/25.

▲† **Foster & Creighton Co.**, American National Bank, Nashville, Tenn., LB, **$2,343,275**, AMC warehouse, roads and utilities, Brookley Air Force Base, MOBILE, ALA. U. S. Eng., P. O. Box 1169, Mobile 7, Ala. CD 2/16, under LB.

▲† **Fordice Constr. Co.**, Porter Bldg., Memphis 3, Tenn. CA **$1,146,800**. casting articulated concrete mattress on Delta, La. casting field approx. 122,000 bbl. cement, CA 22-052-ENG.-4515, LOUISIANA. U. S. Eng., P. O. Box 60, Vicksburg, Miss. CD 2/25, under LB.

† **T. L. James & Co., Inc.**, P. O. Box 531, Ruston, La. CA **$660,100**. casting articulated concrete mattress on Vidalia, La. Casting Field, approx. 70,000 sq. ft. mattress and furnish approx. 70,000 bbl. cement, DA-22-052-ENG. 4509, LOUISIANA. U. S. Eng., P. O. Box 60, Vicksburg, Miss. CD 2/25, under LB, Mississippi and Louisiana.

Farrar Constr. Co., McMinnville, Tenn., CA **$372,266**. sewerage exten. and collection proj., McMINNVILLE, TENN. City, McMinnville, Tenn. Awarded Mar. 8. CD 6/29.

BUILDINGS

LOW BIDS AND CONTRACTS

Wise Contg. Co., 8 and Grace Sts., Richmond, Va. CA Approx. **$750,000**. Research LABORATORY addn., RICHMOND, VA. American Tobacco Co., 26 and Cary Sts., Richmond, Va.

▲ **Robert E. McKee, Inc.**, Box 2848, Dallas, Tex., CA, **$18,732,000** general contract;

Otis Elevator Co., 39 Harris St. N.E., Atlanta, Ga., CA, **$1,184,236**, elevators for Grady HOSPITAL, ATLANTA, GA. Fulton-De Kalb Hospital Auth., 36 Butler St S.W., Atlanta, Ga. Bids Feb. 4. CD 2/8, under LB.

▲ **Geo. D. Auchter Co.**, P.O. Box 1193, Jacksonville, Fla., CA, **$2,179,990**, Talleyrand electric generating STATION addn., JACKSONVILLE, FLA. City, City Hall, Jacksonville, Fla. Bids Jan. 28. CD 12/29.

▲ **J. L. Ewell Eng. & Contg. Co.**, 1248 New Tampa Hy., Lakeland, Fla., CA, **$1,470,077**, Senior High SCHOOL, Plant City, TAMPA, FLA. Hillsborough Co. Bd. P. Instruction, Court House, Tampa, Fla. Bids Feb. 2. CD 2/16, under LB.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **O., Springfield**—NATIONAL GUARD FACILITIES—B.A. 4/8—U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va., constr. Air National Guard Facilities, incl. hangar; warehouse, motor service shop; paint, oil and dope storage; crash truck station; fuel storage and pump house; water pump house; 60,000 gal. water storage tank; runway, taxiway, apron paving; runway and taxiway overlay paving; roadways and parking areas; electrical and water distr. sys., sanitary sewers, septic tank sewage disposal sys., storm drains; grading, seeding, at Springfield Municipal Airport, approx. 5 mi. south of here, Serial No. ENG-46-022-54-16. CD 3/2.

BIDS ASKED—BUILDINGS

Wis., Port Washington—SCHOOL—B.A. 4/2—Bd. Educ., 1 story bsmt. 150x157 ft. high school addn. and alterations and 2 story, 86x156 ft. gymnasium bldg. $900,000. Ebling, Plunkett & Keymar, 1210 N. Milwaukee St., Milwaukee, Zone 2, archts. CD 2/10.

▲ **Mich., Saginaw**—HOUSING—B.A. 4/6—City, Saginaw Housing Comn., Robert J. Bliss, dir., Ave. A. and Harold St., Mich. 6-1,236 family housing units management and maintenance bldg., brick constr., North Sixth Ave. and Saginaw River, $3,000,000. Plans deposit $50 refundable, Leinweber, Yamasaki & Hellmuth, 112 Madison Ave., Detroit, archts. CD 1/12/51.

SOON LETS CONTRACT—BUILDINGS

Mich., Romulus—OFFICE—At office Smith-Hinchman & Grylls, archts., 800 Marquette Bldg., Detroit, soon lets contract, brick, concrete dial exchange office for Michigan Bell Telephone Co., 1365 Cass St., Detroit, Mich. $300,000.

▲ **Wis., Milwaukee**—POWER PLANT UNIT—Wisconsin Electric Power Co., 231 W. Michigan St., Zone 3, soon lets contract 3rd unit, 140x150 by 80 to 150 ft. high, concrete, steel, block, of power plant, Oak Creek. Total est. $23,600,000. H. E. Mundt, c/o owner, engr. CD 3/3/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

R-W Constr. Co., 3140 W. Fond du Lac Ave., Milwaukee, Wis., CA, **$397,110**, storm sewerage sys., SHOREWOOD, WIS. Village, 3930 N. Murray Ave., Milwaukee 11, Wis. Bids Feb. 25, awarded Mar. 9. CD 2/10.

BUILDINGS

LOW BIDS AND CONTRACTS

Banner Realty Co., Danville, Ind. Owner Builds, **$450,000**, 30 HOMES, DANVILLE, IND.

Indiana Central College, 4001 S. Otterben Ave., Indianapolis, Ind. Owner Builds. **$400,000**. APARTMENTS, on grounds, INDIANAPOLIS, IND. CD 8/31.

▲ **Gibbs & Hill**, 461 8 Ave., New York, N. Y., CA, **$14,600,000**, design and construct sixth unit, White River POWER PLANT, at Centerton, incl. 105,000 kw. generating unit, INDIANAPOLIS, IND. Indianapolis Power & Light Co., 17 N. Meridian St., Indianapolis 6, Ind.

▲ **Justus Co.,** Architects Bldg., Indianapolis, Ind., Owner Builds, **$1,000,000,** 46 HOMES, Downey Ave. section of Irvington; **$2,500,000** 125 HOMES, East Tenth St. in Irvington, INDIANAPOLIS, IND. CD 5/2/51.

▲ **Atkinson & Co.,** State Life Bldg., Indianapolis, Ind., Owner Builds, **$3,000,000,** 100 apartment DWELLINGS, 46 and Arlington Aves., **$1,400,000,** 44 unit four apartment DWELLINGS, 46 and Arlington Aves., INDIANAPOLIS, IND.

City, Bd. Educ., 143 Bostwick Ave., Grand Rapids, Mich., rejected bids Jan. 26, service bldg. for school sys., GRAND RAPIDS, MICH. LB. **$432,780.** CD 1/4.

▲ **Spoon & Shacket, Inc.,** 17344 West Seven Mile Rd., Detroit, Mich. Owner Builds. **$2,000,000.** brick concrete SHOPPING CENTER, parking facilities, Royal Oak Twp., ROYAL OAK, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **Missouri**—B.A. 4/1—U. S. Eng., P. O. Box 97, Memphis 1, Tenn., 25,000 cu. yd. embankment, 76 acres slope dressing, 200 acre-passes addnl. compaction, 65 acres sodding and fertilizing, 65 acres mulching, Levee Item No. R-48.2R A.C., Delta, approx. levee stations 0 plus 2-4 plus 40, in Little River Drainage Dist., along Little River Headwater Diversion Channel levee in Cape Girardeau Co., at jct. of levee with high ground about 3 mi. northwest of Delta, extends down levee for distance of approx. 4½ mi., CIVENG 40-041-54-94. CD 5/25/44.

† **Tex., Abilene**—HANGAR—B.A. 4/2—U. S. Eng., 100 W. Vickery St., Fort Worth, maintenance hangar, Abilene Air Force Base, Inv. No. Eng-41-443-54-48. $750,000. CD 12/10/52.

† **Okla., Altus**—HANGAR—B.A. 4/8—U. S. Eng., Box 61, Tulsa, Zone 2, Lot No. 2, steel frame, masonry AC-Maintenance hangar, all supporting facilities, 750,000 gal. steel ground water storage, pumping station, underground utilities, etc., Altus Air Force Base, Inv. No. Eng-34-066-54-55. $900,000. CD 6/27/51.

† **Okla., Ardmore**—HANGAR—B.A. 4/8—U. S. Eng., Box 61, Tulsa, Zone 2, Lot 1, steel frame, masonry, AC/Maintenance Hangar, all supporting facilities, 750,000 gal. steel ground water storage tank, pumping station, underground utilities, etc. Ardmore Air Force Base, Inv. No. Eng-34-066-54-55. $875,000. CD 1/24/52.

BIDS ASKED—BUILDINGS

▲ **Colo., Lakewood** — SCHOOLS — B.A. 3/30—Jefferson County School District No. R-1, 1580 Yarrow St., 3 elementary schools, 6300 West. 1 Ave., South Harlan St. and Jefferson Place and West 9 Ave. and Harlan St., $1,146,000. T. H. Buell & Co., 730 14 St., Denver, engr. John K. Monroe, 400 Security Life Bldg., Denver, consult. engr.

Mont., Helena—LABORATORY—B.A. 4/20—State, Bd. Examiners, Helena, 3 story, W-shaped laboratory, $900,000. V. H. Walsh, Helena, archt. CD 12/16, under LB.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **IOWA**—State Hy. Comn., Ames,

Hallett Constr. Co., Crosby, Minn., LB, **$251,764,** paving 4.872 mi. FI-340 (17), Dallas Co.; LB, **$107,537,** paving 2.033 mi. F-349 (16), Polk Co.;

Booth & Olson, Inc., 529 Insurance Exchange Bldg., Sioux City, LB, **$396,895,** paving 7.882 mi. Special F-269 (2), Sioux Co., LB **$365,729,** paving 2.263 mi. U-1001 (L) Woodbury Co.;

Orville Eblen Constr. Co., Atlantic, Ia., LB, **$82,519,** grading 4.472 mi. Special F-861 (3) Crawford, Harrison and Monona Counties; LB **$97,584** grading 4.714 mi. F-289 (4), Johnson Co.;

Fred Carlson Co., Decorah, Ia., LB, **$105,573,** paving 1.059 mi. F-35 (4), Chickasaw Co.;

Mickley Ross Constr. Co., Newton, Ia., LB, **$66,041** grading 2.53 mi. F-211 (5), Marshall Co.;

Gene McClain, Allerton, Ia., LB, **$96,431,** rolled stone base and bit. surf. 5.227 mi. S-1440 (1), Clinton Co. Bids Mar. 9. CD 2/25.

† **Yancy B. Turner,** 914 W. 13 St., Pine Bluff, Ark., LB, **$246,600,** Item DR-81.0-R, revetment and pile dike, New Gascony Reach, Trulock, Jefferson Co., ARKANSAS. U. S. Eng. P.O. Box 60, Vicksburg, Miss. Bids Feb. 24. CD 2/9.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,

Broce Constr. Co., Woodward, Okla., CA **$94,393,** est. $104,293, asph. stabil. base, single bit. surf. 3.879 mi. U.S. 64, Keyes, Cimarron Co.; LB **$213,524,** est. $249,671, 7 mi. asph. stabil. base, single bit. surf., U.S. 64, Keyes, Cimarron Co.;

John M. Erts Co., 1517 N. Broadway, Oklahoma City 3, Okla., CA **$220,717,** est. $286,303, 7 mi. drain and rock asph. surf. U.S. 271, Albion, Pushmataha Co.;

G. E. Keck, Fairview, Okla., CA **$166,448,** est. $200,785 grade, drainage and two bridges 5.479 mi. U.S. 59, Grove, Delaware Co.;

Lyles & Buckner, Surety Bldg., Muskogee, Okla., CA **$157,682,** est. $170,313, c. conc. Third St. in Miami, Ottawa Co.;

McConnell Constr. Co., Surety Bldg., Muskogee, Okla. CA **$153,933,** est. $189,686, single bit. surf. course 7.06 mi. Bessie, Washita Co.; CA **$128,633,** est. $160,983, single bit. surf. course 6 mi. Bessie, Washita Co.;

Pool Constr. Co., Shawnee, Okla., CA **$222,268,** est. $292,928, grade, drainage, minor structures 4.92 mi. U.S. 62 at Henryetta, Okmulgee Co.; CA **$133,243,** est. $189,007, traffic bound surf. course 7.001 mi. No. 74, Lindsay, Garvin Co.;

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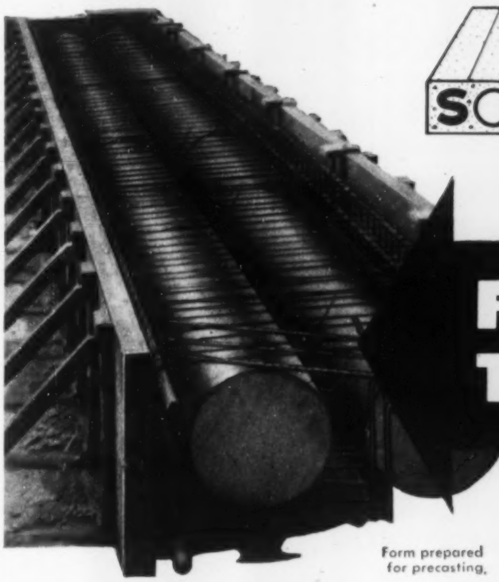

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W. E. Steelman, 2800 N.E. 4 St., Oklahoma City 4, Okla. CA **$195,677**, est. $227,504, single bit. surf. 7.24 mi. Hy. 8, Okeene, Blaine Co. Grand total, $1,686,518. Bids Mar. 9, awarded Mar. 10. CD 3/2.

Acme Constr. Co., Bethany, Okla., CA **$315,127**, est. $353,000, 4-H and FFA Exhibit Bldg., OKLAHOMA CITY, OKLA., City, City Hall, Oklahoma City, Okla. Bids Dec. 22. CD 12/16.

City, City Hall, Main and Harwood Sts., Dallas, Tex. Own Forces. **$190,000**, some general street imprvs., grading, drainage, some surf. in various sections of DALLAS, TEX. CD 11/21/51.

City, City Hall, Main and Harwood Sts., Dallas, Tex. Own Forces. **$150,000**, some storm sewer work in various sections of DALLAS, TEX. CD 11/21/51.

COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver,

Henry Shore, Littleton, Colo., CA, **$79,520**, est. $71,930 surf., asph. processing 9.994 mi. State Hy. No. 100 between Beshear Junction and Kim S 0002 (14), Las Animas Co.;

J. H. & N. M. Monaghan & Assocs., Derby, Colo., CA, **$326,878** 7.019 mi. State Hy. 84, S 0134 (4) and S 0134 (3) Routt and Grand Counties. Bids Mar. 4, awarded Mar. 8. CD 2/26.

BUILDINGS

LOW BIDS AND CONTRACTS

C. S. Lambie & Co., Box 1167, Amarillo, Tex., LB **$933,150**, est. $550,000. JUNIOR HIGH SCHOOL, AMARILLO, TEX. Amarillo Independent School Dist., Amarillo, Tex. Bids Mar. 9. CD 2/10.

F. Avanzini, Builder & Co., 114 Northview St., Houston, Tex., CA **$336,116**, 29 DWELLINGS; CA **$353,615**, 33 DWELLINGS, HOUSTON, TEX. F. Avanzini, 1014 W. 42 St. Houston, Tex. CD 2/18.

Norvil J. Wilson, 3750 Nottingham St., Houston, Tex. Purchases, Day Labor. **$339,175** seven 2 story masonry DWELLINGS, concrete pier and beam fdn., HOUSTON, TEX.

Norvel F. Favel & Wm. N. Floyd, 983 W. 41 St., Houston, Tex. Own Forces. **$325,000**. 28 DWELLINGS, HOUSTON, TEX. CD 2/23.

▲ **J. J. Fritch Constr. Co.**, 6823 Harry Hines Blvd., Dallas, Tex., LB **$2,238,870**. 600-bed HOSPITAL, SAN ANTONIO, TEX. Bd. for Texas State Hospitals & Special Schools, 45 and Lamar Sts., Austin, Tex. Bids Mar. 11. CD 2/2.

▲ **The Ralph M. Parsons**, 617 S. Olive St., Los Angeles, Calif., CA, **$1,115,000**. sulfur-recovery PLANT near ANDERSON, WYO. Jefferson Lake Sulphur Co., Anderson, Wyo. CD 2/19.

▲ **The Ralph M. Parsons Co.**, 617 S. Olive St., Los Angeles, Calif., CA, **$1,625,000** dehydrating and sweetening PLANT, WORLAND, WYO. Socony-Vacuum Oil Co., Inc., and Associated Companies, Worland, Wyo. CD 2/19.

▲ **Gerald A. Phipps, Inc.**, Box 2608 Denver, Colo., CA, **$1,500,000**, 1 story brick, steel, concrete 60,000 sq. ft. FACTORY, two processing lines, E. 46 Ave. and Dahlia St., DENVER, COLO. American Can Co., 1835 N. Clybourn Ave., Chicago, Ill. Cabot, Cabot & Forbes, Inc., 60 State St., Boston, Mass., engr. and archt.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Washington** — SUB-STATION — B.A. 4/5—Bonneville Power Admin., 827 N.E. Oregon St., Portland. Ore., constr. Kitsap Sub-station, Kitsap Co., Inv. 7291. Plans deposit $25. L. C. Stewart, 827 N.E. Oregon St. Portland, Ore., engr. CD 2/5/51.

▲ **California**—B.A. 4/6—United Water Conservation District, 806 Railroad Ave., Santa Paula, constr. Santa Felicia dam and appurtenant works, on Piru Creek, near Piru, Ventura Co. Plans deposit $25. Extended date. Julian Hinds, c/o owner, genl. mgr. and ch. engr., adv. ENR 3/25. CD 3/3.

† **California**—B.A. 4/22—Bureau Reclamation, Dpt. Interior, Lindsay, earthwork, pipe lines and structures incl. pumping plants, laterals and sublaterals, Unit 3, Delano-Earlimart Irrigation District, Friant-Kern Canal Distribution Systems Central Valley Proj., near Delano, Spec. DC-4137. W. A. Dexhermer, comn., adv. ENR 3/25. CD 4/20/45.

BIDS ASKED—BUILDINGS

▲ **Calif., La Mesa**—HOSPITAL—B.A. 4/5—Grossmont General Hospital, 9325 El Cajon Blvd., Grossmont, 3 story, rein.-con. hospital. $1,834,029. Plans deposit $75. Pereira & Luckman, 9220 Sunset Blvd., Los Angeles, archts. CD 10/5.

▲ **Wash., Seattle**—COMMUNICATIONS—B.A. 4/27—University of Washington, Seattle, Zone 5, 3 story communications bldg. addn. $1,000,000. G. Gove, Tacoma Bldg., Tacoma, archt. CD 2/26.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Morrison-Knudsen Co.**, 319 Broadway and **J. A. Terteling Son**, 4011 Fairview Ave., Boise, Idaho, LB, **$616,341**, est. $597,543 apron extension, Mountain Home Air Force Base, ENG-45-165-54-13, MOUNTAIN HOME, IDAHO U. S. Eng, City-County Airport, Mountain Home, Idaho. Bids Mar. 10. CD 2/5.

† **Linn-Lane Constr. Co.**, Sweet Home, Ore., LB **$144,683**, Schedule 1; LB **$169,633**, Schedule III, clearing right of way and constr. access roads for Detroit-Santiam No. 1 and 2, and Santiam-Chemawa line and cleanup of Detroit-Lyons right of way, Marion and Linn Counties, Inv. 7274, OREGON. Bonneville Power Admin., 827 N.E. Oregon St., Portland, Ore. Bids Mar. 9. CD 2/16.

BUILDINGS

BIDS ASKED—BUILDINGS

▲ **James Stewart Co.**, Employers Insurance Bldg., Dallas, Tex. CA, **$2,740,000**, 10 story, bsmt. BANK and OFFICE, PHOENIX, ARIZ. First National Bank of Azrizona, 16 North 1 Ave., Phoenix, Ariz. Bids Feb. 10. CD 2/16, under LB.

▲ **D & E Corp.**, 463 S. Robertson Blvd., Beverly Hills, Calif., CA, **$1,328,000**, 164 frame, stucco DWELLINGS, Adorce and Angell Sts., etc., BELLFLOWER, CALIF. Red Bird Associates, 463 S. Robertson Blvd., Beverly Hills, Calif.

▲ **Crown Constr. Co.**, 1231 S. La Brea Ave., Los Angeles, Calif., CA, **$1,116,000**, Pueblo Del Rio Extension, Part 2, Low Rent HOUSING, LOS ANGELES, CALIF. Housing Authority of City of Los Angeles, 1401 East First St., Los Angeles, Calif. Bids Jan. 26, awarded Mar. 11. CD 1/29, under LB.

▲ **James I, Barnes Constr. Co.**, 1119 Montana Ave., Santa Monica, Calif. CA, **$3,941,700**, Reseda High SCHOOL, Reseda, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Feb. 24, awarded Mar. 4. CD 3/2, under LB.

CANADA

BIDS ASKED—BUILDINGS

Ont., Dunnville—FACTORY—B.A. 4/2—Sylvania Electric (Canada) Ltd., 660 St. Catherine St. W., Montreal, Que. 1 and 2 story, 50,000 sq. ft., steel, brick, concrete block factory. Over $300,000. Extended date. S. G. Chipman & Co., 234 Queens Ave., London, engrs. CD 3/10.

BUILDINGS

LOW BIDS AND CONTRACTS

Moir Constr. Co. Ltd., Box 122, St. Catherines, Ont., CA, **$300,000**, Buildings 2 and 3 alterations, ST. CATHERINES, ONT. St. Catherines General Hospital, St. Catherines, Ont. Govan, Ferguson, Lindsay, Kamineker, Langley & Keenleyside, 515 Jarvis St., Toronto, Ont., archts. Macbeth & Williams, 104 Queen St., St Catherines, Ont., archts. Awarded Mar. 8.

Sterling Constr. Co. Ltd., 2494 Sandwich St. E., Windsor, Ont., CA, **$800,000**, 1 story, 232x250 ft., STORE and parking lot, SARNIA, ONT. Simpson-Sears Ltd., 176 Yonge St., Toronto, Ont. F. S. Corley, c/o owner, archt. CD 9/21.

▲ **LaFamiliale Co-operative**, 5271 St. Hubert St., Montreal, Que. Owner Builds, **$8,750,000**, 700-unit concrete brick HOUSING, St. Hubert St. near Cote St. Michel Rd., MONTREAL, QUE.

Proposed Projects

WATER SUPPLY

Que., St. Joseph de Sorel—Municipality, City Hall WW sys. **$500,000**. Lalonde & Assocs., 7379 St. Hubert St., Montreal, consult. engrs.

SEWERS, WASTE DISPOSAL

▲ **Calif., San Jose**—Santa Clara Sanitary District, No. 3, San Jose, **$1,075,000** bond election postponed indefinitely, sanitary sewerage sys. CD 2/18.

Ill., North Lake City—Village of North Lake City sanitary relief sewers, **$600,000**. Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago, Zone 6, consult. engrs.

Ind., Seymour—Bd. P. Wks., D. L. Heiwig, mayor chn., City Hall, sewage treatment plant and sewer exten. **$500,000**. Henry B. Steeg & Assocs., 2331 N. Meridian St., Indianapolis, Zone 2, consult. engrs.

▲ **O., Avon Lake**—City, storm sewers, **$1,100,000**; intercepting sewer and sewage and sewage treatment plant. Finkbeiner, Pettis & Strout, 518 Jefferson St., Toledo, consult. engrs. CD 11/10.

BRIDGES

W. Va., Charleston—City, City Bldg., Charleston, 480 ft. bridge across Elk River for Brown St. **$750,000**. R. W. Haworth, 1 Morris St., engr. CD 11/16, under Streets and Roads.

STREETS AND ROADS

Ill., Chicago—City, City Hall, resurfacing Milwaukee Ave. from Armitage to Belmont Aves. **$550,000**. CD 4/24/45.

▲ **OHIO**—State Hy. Dpt., Columbus,

Sandusky Co.—9.7 mi. imprvt. U. S. 20 bypass, in Fremont which will connect to north with the east-west Ohio Turnpike, **$6,500,000**. Consoer, Townsend & Assocs., 351 E. Ohio St., Chicago, Ill., consult. engrs. CD 12/4.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City,

Comanche Co.—four-lane hy. U. S. 52. west of Gore Blvd., Lawton, **$720,000**. G. H. Bittle, c/o owner, engr.

EARTHWORK, WATERWAYS

▲ **Michigan**—U. S. Eng., 1900 Cadillac Tower, Detroit, flood control constr. along Kalamazoo and Battle Creek Rivers, **$5,000,000**.

▲ **British Columbia**—British Columbia Power Corp. Ltd., 425 Carrall St., Vancouver, hydro-electric development on Columbia River, dam at Mico Creek and dam on upper Kootenay River power development, **$400,000,000**.

▲ **Quebec**—Quebec Streams Commission, Notre Dame St. Montreal, dam on Lake des Araignees on Riviere Chaudiere, **$900,000**; reconstr. dam on River Manouarie, Manigouche, **$950,000**; raising lake Morin Dam on Riviere du Loup, **$700,000**; constr. dam (Lake Cabonga) on Gatineau River, Gatineau, **$1,800,000**.

AIRPORTS

▲ **Pa., Phila.**—AIRPORT—Dpt. Procurement, City Hall Annex, North Phila. Airport, air terminal development and facilities for Helicopter Operation, **$4,247,000**. CD 2/19/46.

▲† **Wash., Seattle**—BUILDINGS, etc.—Boeing Airplane Co., 7755 E. Marginal Way, Seattle, Zone 4, plans by J. W. Maloney, Central Bldg., Zone 4, test buildings, electrical sub-station, etc. at Boeing Field for U. S. Air Force, **$1,000,000**. CD 3/8.

▲ **Ont., Fort William**—RUNWAYS, etc.—Trans-Canada Airlines, Aviation Bldg., Montreal, Que., exten. 2 runways, resurf. others at Lakehead Airport, **$1,000,000**.

LATIN AMERICA

Colombia—Department Valle Del Cauca, Bogota, plans highway development, maintenance and improvement program. Knappen-Tippetts-Abbett-McCarthy, 62 W. 47 St., New York, N. Y.

AMERICANS ABROAD

N. W. I., **Aruba**—Esso Standard Oil Co., 15 W. 51 St., New York, N. Y., U. S. A., preliminary survey of San Nicholas, Harbor. Knappen-Tippetts-Abbett-McCarthy, 62 W. 47 St., New York, N. Y., U. S. A.

PUBLIC BUILDINGS

Calif., Monterey—SCHOOL—Monterey City Elementary School District, Box 1031, plans by Butner, Holm & Waterman, 1112 Pajaro St., Salinas, voted **$990,000** bonds, elementary school. CD 6/24.

▲ **Calif., Oakland**—SCHOOLS—City, City Hall, defeated **$22,852,000** bonds reconstr. and repairing present school bldgs.; **$7,148,000** bonds constructing new schools. CD 1/7.

▲ **Calif., Palo Alto**—HOSPITAL—City, City Hall, **$4,000,000** bond election June 8, rehabilitation of Palo Alto Hospital. CD 8/19/46.

▲ **Calif., Pomona**—SCHOOLS—Pomona Unified School District, Pomona, **$2,000,000** bond election May 4, schools.

▲ **Calif., Redwood City**—SCHOOLS—Redwood City Elementary School District, Redwood City, defeated **$1,500,000** bonds, new school. CD 12/21.

▲ **Calif., Redwood City**—SCHOOLS—Sequoia Union High School District, Redwood, defeated **$3,200,000** bonds new highway schools, etc. CD 12/2.

Conn., New Canaan—SCHOOL—Town Bd. Educ., New Canaan, plans by Moore & Hutchins, 237 E. 37 St., New York, N. Y., Senior High School, Keil Property, Lower South Ave. **$850,000**. CD 12/5/52.

▲ **Ga., Atlanta**—EDUCATIONAL CENTER—University of Georgia, Athens, plans by Lewis J. Sarvis, 258 Champion St., Battle Creek, brick, steel, concrete educational center, Georgia Kellogg Center, **$2,000,000**.

▲ **Ind., Logansport**—LIGHT PLANT, etc.—City, City Hall, electric light plant and distr. sys. **$3,424,000**.

Ind., Muncie—SCHOOL—Mount Pleasant Twp., Ray Miller, trustee, R.R. 6, Muncie, plans by Hamilton & Graham, Western Reserve Bldg., Consolidated Township School, near here. **$950,000**.

▲ **Minn., Edina (Minneapolis P.O.)** — SCHOOL — Bd. Educ., Edina-Morningside Independent School Dist. No. 17, M. H. Kuhlman, supt., $2,475,000 bond election Mar. 23, Junior High School, **$2,090,000**; grade school addn., **$350,000**. Bissell & Belair, 1111 Nicollet Ave., Minneapolis, archts. CD 1/6/54.

Minn., Minneapolis—DORMITORY—Regents of University of Minnesota, Admin. Bldg., Main Campus, plans by C. H. Johnston, 715 Empire Bank Bldg., St. Paul, 2 wings to Centennial Hall dormitory at 612 S.E. Delaware St., **$830,000**.

▲ **Neb., Ogalla**—GENERATING PLANT—Consumers Public Power Dist., 1452 25th Ave., Columbus, steam generating plant, **$2,100,000**. Fay E. Smith & Assocs., 821 Brentwood Rd., Omaha, consult. engrs. R. L. Schacht, c/o owner, ch. engr. CD 5/19.

▲ **N. Y., Kew Gardens**—COURT HOUSE—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, plans by Alfred Easton Poor & William Gehron, Associated Architects, 787 Fifth Ave., New York, Zone 22, 8 story court house in area bounded by Queens Blvd., 82 Ave., 132 St. and Hoover Ave. **$12,000,000**. CD 3/18/53.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 63 Park Row, New York, Zone 38, Jasper Houses, for 1,275 families on site bounded by W. 133 St., Amsterdam Ave., W. 129 St., Broadway, W. 131 St. and Old Broadway. **$14,000,000**. CD 1/5/45.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 63 Park Row, Zone 38, Benjamin Franklin

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Diagram of PIONEER Conveyor showing:
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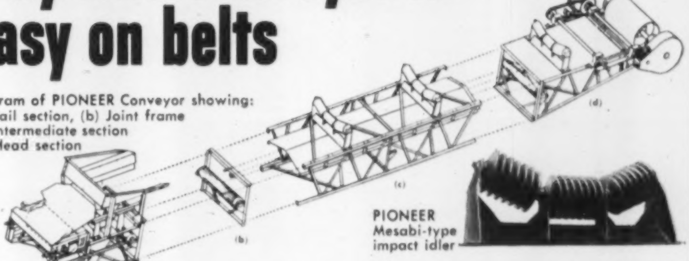
(c) Intermediate section
(d) Head section



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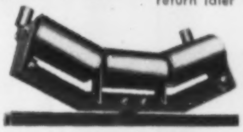

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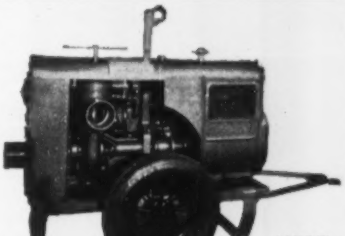

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Houses, for 1,250 families, on site bounded by E. 108 St., Frost Ave., E. 106 St., Third Ave. **$17,000,000.** CD 3/31/48.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 63 Park Row, Zone 38, Castle Housing, Seward, Castle Hill, Cincinnatus, Havemeyer, LaCombe and Olmstead Aves. **$19,046,000.** CD 1/5/45.

▲ **O., Columbus**—COURT HOUSE—Comrs. Franklin Co., Court House, plans by Ralph C. Kempton, 50 W. Broad St., remodeling old court house. **$2,372,000.**

▲ **O., Nelsonville**—HOSPITAL—State Dpt. P. Welfare, State Office Bldg., S. Front St., Columbus, tuberculosis hospital. **$1,150,000.**

▲ **Pa., Broomall**—HIGH SCHOOL—Marple-Newtown Joint School Bd., Newtown Square, Phila., high school. **$1,250,000.**

▲ **Pa., Chadds Ford**—HOSPITAL—General State Auth., 18 and Herr Sts., Harrisburg, constr. State Mental Hospital. **$18,000,000.** A. F. Jones, c/o owner, ch. engr.

▲ **Pa., Glenside**—SCHOOL—Cheltenham Twp. School Dist., Elkins Park, plans by Heacock & Platt, 1505 Race St., Phila., elementary school, Limekiln Pike and Church Rd. **$1,000,000.**

▲ **Pa., Phila.**—HOSPITAL—General State Auth., 18 and Herr Sts., Harrisburg, 500-bed hospital for tubercular patients, at Corinthian and Girard Aves. **$6,000,000.** A. F. Jones, c/o owner, ch. engr.

▲ **Pa., Wilkes-Barre**—MENTAL INSTITUTION—General State Auth., 18 and Herr Sts., Harrisburg, state mental institution for defective delinquents, near here. **$10,000,000.** A. F. Jones, c/o owner, ch. engr.

▲ **Tenn., Bolivar**—TREATMENT STATION, etc.—State of Tennessee, Nashville, plans by Taylor & Crabtree, 1908 Church St., Nashville, brick, concrete, steel, stone, timber treatment station and receiving center at Central State Hospital. **$1,000,000.**

▲ **Tex., Corpus Christi**—SCHOOLS—Corpus Christi Independent School Dist., 515 N. Carancahua St., voted bonds Mar. 6, school group addns. **$400,000;** elementary schools, **$400,000** No. 1; **$400,000** No. 2; **$400,000** No. 3; new high school **$1,750,000;** Junior High School in DeZavala Elementary area, **$400,000;** Junior High School between Lexington-Holly on Old Kostooryz Rd. **$800,000.** CD 2/18.

▲ **Tex., Victoria**—HOSPITAL—Victoria Co., Court House, Victoria, plans by Ault & Rick, Victoria, and O'Connell & Probst, 305 Perry Brooks Bldg., Austin, 4 story, 100-bed steel, brick, stone walls county hospital. **$1,750,000-$2,000,000.** Blum & Guerrero, 4930 Maple St., Dallas, Walter P. Moore, 2 Pinedale St., Houston, and Ault & Rick, Victoria, consult. engrs. CD 6/15.

Va., Williamsburg—GYMNASIUM—College of William & Mary, Williamsburg, plans by Charles M. Major, Williamsburg, 1 story masonry women's gymnasium. **$890,000.** CD 12/21.

▲ **Alta., Edmonton**—HIGHWAY—Alberta Government, Parliament Bldgs., 3 story, bsmnt., precast concrete 100,000 sq. ft. highway bldg., on site near Parliament Bldgs. **$1,100,000.**

▲ **Alta, Edmonton**—SCHOOL FOR DEAF—Alberta Government, Parliament Bldgs., two units, 66,000 sq. ft., School for Deaf. **$1,200,000.**

▲ **B. C., Richmond**—SCHOOLS—School District No. 38, Richmond, plans by K. J. Sandbrook, 615 Columbia St., New Westminster, Junior High and 3 elementary schools. **$1,300,000.**

▲ **Ont., Midland**—SCHOOL—Midland-Penetang District High School Board, Midland, high school in outskirts of Midland Twp. of Tay, **$1,000,000.**

▲ **Ont., Ottawa**—ART GALLERY—Dpt. P. Wks., Hunter Bldg., Ottawa, plans by Green, Blankstein, Russell & Assoc., 222 Osborne Ave. W., Winnipeg, Man., 3 story, bsmt., national art gallery on Sussex St., **$5,000,000.** CD 11/9/43.

COMMERCIAL BUILDINGS

▲ **Calif., Concord**—SHOPPING CENTER—Biltmore Homes Inc., 9434 Long Beach Blvd., South Gate, shopping center, Clayton Rd. **$1,400,000.**

▲ **Calif., Puente**—DWELLINGS—McDonald Brothers, c/o Ed. H. Fickette, 5657 Wilshire Blvd., Los Angeles, 130 frame, stucco dwellings, **$1,000,000.**

▲ **Calif., San Jose**—HOSPITAL—Doctors General Hospital, 976 Lenz Ave., plans by Donald Francis Haines, 144 W. San Carlos St., 96-bed hospital, Wright Ave. **$1,000,000.**

▲ **Del., Wilmington**—SUPERMARKET, etc.—Best Market, 2301 Market St., Phila., Pa., supermarket and shopping center, **$1,000,000.**

▲ **Ill., Chicago**—EXHIBIT—Chicago International Amphitheatre, 42000 S. Halsted St., plans by A. Epstein & Sons Co., 2011 Pershing Rd., Zone 9, 180,000 sq. ft. exhibit bldg. addn. **$2,000,000.**

▲ **Ill., Chicago**—OFFICE—Illinois Bell Telephone Co., 206 W. Washington St., Zone 6, plans by Victor Charn, 4744 W. Rice St., Zone 51, accounting office. **$1,500,000.**

▲ **Kan., Kansas City**—SHOPPING CENTER—Owner, c/o Crute & O'Bryan, archts., Bennett Bldg., Kansas City, Kan., 60,000 sq. ft. shopping center, Wyandotte Co., near here, **$1,000,000.**

▲ **Ky., Louisville**—SCHOOL, etc.—Roman Catholic Diocese, John Floersch, archbishop, c/o Thos. J. Nolan & Sons, archts., Kentucky Home Life Bldg., girls' school, convent, sisters' house, Tyler Lane and Bardstown Rd. **$1,000,000.**

▲ **Md., Upper Marlboro**—APARTMENTS, etc.—Frank Development Co., Inc., 1523 L St. N.W., Wash.,

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—18"	11.50	10.50	—18"	7.50	6.50
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▲ **Mich., Grand Rapids**—OFFICE—Michigan Bell Telephone Co., 1365 Cass St., Detroit, brick, steel, concrete dial office, Central Dialing Terminal for Western Michigan, **$5,000,000.**

▲ **Mo., St. Louis**—OFFICE—Merchants Exchange of St. Louis, 111 N. 3 St., Zone 2, plans by Marcel Boulicauit, Ambassador Bldg., 411 N. 7 St., Zone 1, 23 story, bsmnt., incl. 2-level garage for tenants, steel, rein.-con. office to replace present exchange bldg. west side of 3 St. from Chestnut to Pine St. containing more than 330,000 sq. ft. floor space **$10,000.000.**

▲ **N. J., Woodbury**—APARTMENT—Oakwood Bldg. Co., Louis Belznak, North Broadway, plans by Dante J. D'Anastasi, 1815 Federal St., Camden, 14 story apartment **$1,000,000.**

▲ **N. Y., Binghamton**—MOTEL, etc.—Philip J. Levin, 104 W. 4 St., Plainfield, N. J., motel and shopping center, 76-acre tract. **$2,000,000.**

▲ **N. Y., Brooklyn**—APARTMENTS—Marbreen Holding Corp., 26 Court St., Zone 2, plans by Morris Rothstein & Son, 186 Joralemon St., Zone 2, two 6 story apartments, 2513-33 W. 2 St. and 2535 W. 2 St. **$1,800,000.**

▲ **N. Y., Hempstead**—SHOPPING CENTER—Roosevelt Field, Inc., c/o Webb & Knapp, Inc., 383 Madison Ave., New York, Zone 17, shopping center on 130-acre tract to include new Macy Store. **$35,000,000.** Syska & Hennessy, Inc., 144 E. 39 St., New York Zone 16, mechanical engr. Severud-Elstad-Kreuger, 415 Lexington Ave., New York, Zone 17, structural engrs. Skidmore, Owings & Merrill, 575 Madison Ave., New York, Zone 22, archts. for Macy's Store. Ieoh Ming Pei, 270 Park Ave., New York, Zone 17, owners designer for entire proj. CD 11/11.

▲ **Pa., Bryn Mawr**—APARTMENTS—Kevy K. Kaiserman, 52nd St. and Montgomery Ave., Phila., 4 apartments, Montgomery Ave. **$1,000,000.**

▲ **Pa., Upper Darby**—SHOPPING CENTER—Garbev, Inc., 856 Main St., Darby, shopping center, Garrett and Marshall Rds. **$2,000,000.**

▲ **Tex., Amarillo**—COMMERCIAL—Petroleum Building Inc., c/o Dave Rubin, 310 W. 6 St., plans by Ramco Co., Inc., archt.-engr., 3908 Lemmon St., Dallas, 6 story bsmnt., terra cotta, asphalt tile commercial bldg., concrete pier and beam fdn. **$1,800,000.**

▲ **Tex., Dallas**—SHOPPING CENTER—J. A. Crow & Co., 229 Lake Park Shopping Village, Dallas, masonry Emerald Isle Shopping Center, 50 business units, Garland Rd. **$2,750,000.**

▲ **Tex., Dallas**—SHOPPING CENTER—J. M. Tuttle Co., No. 6 Lake Highland Shopping Center, Dallas, 170,000 sq. ft. masonry type shopping center, N.W. Hy. and Eaton Rd. **$2,250,000.**

▲ **Wash., Pasco**—HOUSES—Intermountain Mortgage Co., Pasco, 180 houses, **$1,800,000.**

▲ **Que., Montreal**—HOUSING—Elite Investment Corp. Luc Rd., plans by Bem-Ami Shulman, 5174 Cote des Neiges Rd., 182 bungalows in housing development on new streets near Cote St. Luc. Rd. **$2,275,000.**

INDUSTRIAL BUILDINGS

▲ **Ala., Scottsboro**—PLANT—Burlington Mills, Empire State Bldg., 300 Fifth Ave., New York, N. Y., nylon hosiery plant, **$1,225,000.**

▲ **Ill., Belvidere**—FACTORY—Sunstrand Machine Tool Co., Rockford, plans by Olsen & Urbain, 5 S. Wabash St., Chicago, Zone 3, 250,000 sq. ft. factory, **$2,500,000.** CD 12/31.

▲ **Ill., Rockford** — FACTORY — Sunstrand Machine Tool Co., plans by Olsen & Urbain, 5 S. Wabash St., Chicago, Zone 5, 10,000 sq. ft. factory, 11 St. **$1,000,000.** CD 2/20/51.

▲ **Kan., Topeka**—TRUCK TERMINAL—Topeka Truck Sales, R. C. Carr, mgr., 418 Quincy St., truck terminal and service center, Rock Island R.R. and Hy. 24, **$3,000,000.** (**Correction**—owner's name). CD 2/18, under Robert Carr, as owner.

▲ **Me., Wiscasset**—STEAM ELECTRIC PLANT—Central Maine Power Co., 9 Green St., Augusta, steam-electric plant addn., incl. oil storage tank for 130,000 gal., Mason Station. **$7,500,000,** Jackson & Moreland, 31 St. James Ave., Boston, Mass.; consult. engrs.

▲ **N. J., Camden**—FACTORY—Campbell Soup Co., 100 Market St., plans by Alexander D. Crosett, archt. and engr., 27 William St., New York, N. Y., factory alterations, **$1,000,000** (**Correction**—name of architect-engineer). CD 3/8.

N. J., Flemington—PLANT—Visking Corp., 65 St. and Oak Park Ave., Chicago, Ill., plant, near here, **$800,000.**

▲ **N. Y., Brooklyn**—PLANTS, etc.—Charles Pfizer & Co., 11 Bartlet St., drug and anti-biotic plant addn. **$5,000,000;** Product packing plant and admin. office, **$5,000,000,** Ellery St., Flushing and Tompkins Aves.

▲ **Tex., Freeport**—PLANTS, etc.—Dow Chemical Co., Freeport, polythylene plant, **$12,000,000;** glycerine plant, **$5,500,000;** smoke reduction sys., incl. several underground steel smoke storage tanks, steam injection pipes and burning of excess carbon particles, **$300,000;** fresh water canal, **$125,000;** surface drainage, **$95,000;** earthen canal for seawater intake, **$145,000;** steam supply line loops, **$100,000;** water sys., **$75,000;** sanitary-storm sewers, **$70,000;** electric area lighting, 65,000; general paving of walks, street and plant areas,

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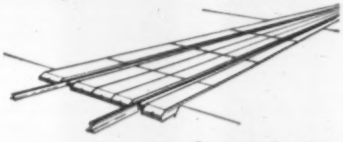

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concrete and asph. **$125,000;** natural gas mains, distr. lines, **$71,500,** in 140-acre tract. CD 5/9/52.

▲ **Tex., Houston**—RECOVERY PLANT—Sinclair Refining Co., 2119 Loffland St., sulphur recovery plant unit, 30-tons sulphur daily capacity. **$2,750,000.** The Ralph M. Parsons Co., 617 S. Olive St., Los Angeles, Calif., consult. engr. CD 5/9/47.

▲ **Ont., Brantford** — FACTORY — A. G. Spalding & Brothers of Canada Ltd., 5 Edward St., 1 story, 300x300 ft., factory on 20-acre site on Hy. 53, in western section. **$1,000,000.**

UNCLASSIFIED

▲ **Arizona**—RURAL DISTRIBUTION LINES, etc.—Wellton-Mohawk Irrigation & Drainage District, Wellton, 300 mi. rural distri. line, 30 mi. 34.5 kv transmission line, 3,000 kva sub-station and sys. imprvts., Wellton Co., **$1,350,000.**

Ill., Chicago—RESURFACING—Chicago Park District, 425 E. 14 St., Zone 5, resurfacing Jackson Blvd. from Michigan to Kostner Aves. **$500,000.** CD 4/30/45.

Louisiana—RURAL DISTRIBUTION LINES—Washington St. Tammany Electric Co-operative, Franklinton, 65 mi. rural distr. lines, 44.8 mi. 34.5 kv transmission line, seven sub-stations, sys. imprvs., Washington Co. **$630,000.**

▲ **Ohio and West Virginia**—TRANSMISSION LINES, etc. —Ohio Power Co., 301 Cleveland Ave., S. W., Canton, O.

TRANSMISSION LINES

complete 132,000-volt line from West Mt. Vernon Substation to South Kenton Sub-station, **$350,000.**
constr.. 330,000-volt line between Muskingum River Plant and East Lima Sub-station, **$1,800,000.**
begin constr. of second circuit of 330,000-volt line between Philip Sporn and Muskingum River Plants, **$700,000.**
complete second circuit of 132,000-volt line between Philo Plant and Torrey Sub-station, Canton, **$200,000.**
complete 132,000-volt line, to be operated initially at 66,000 volts, between Tidd Plant and new South Cadiz Sub-station, **$430,000.**
complete $132,000-volt line between Wagenhals Substation, Canton and new West Canton Sub-station, **$330,000.**
complete 132,000-volt line between West Lancaster Substation and North Neward Sub-Station, **$130,000.**
complete 132,000-volt line between East Lima Substation and Rock Hill Sub-station, Lima, **$190,000.**
complete Ohio portion of 132,000-volt line from Tidd Plant to Weirton, W. Va. **$170,000.**
complete constr. 33,000-volt line between South Coshocton Sub-station and Killbuck Sub-station, **$108,000.**
complete constr. 33,000-volt line between Oertles Corners anf Beaver near Portsmouth, **$130,000.**
complete constr. 66,000-volt and 22,000-volt lines to West Alikanna Sub-station, near Steubenville, **$116,000.**
complete constr. 22,000-volt line between South Kenton Sub-station and United Electric Co-op. Sub-station, **$50,000.**

DISTRIBUTION LINES

complete cutover in Zoarville area, near Canton, from 6,900 volts to 12,000 volts, **$82,000.**
tie in 4,000-volt lines to new North Coshocton Substation and change Cambridge Road line from 4,000-volts to 12,000-volts, **$100,000.**
street lighting imprvs., Bucyrus, **$70,000.**
convert distr. sys. in area east of Zanesville from 4,000 volts to 12,000 volts, **$150,000.**

O., Canton—SUB-STATION, etc.—Ohio Power Co., 301 Cleveland Ave. S. W., constr. new transmission substation in West Canton (132/22) to receive new 132,000-volt Wagenhals-West Canton line, **$625,000;** install three 5,000,000-kva, 132,00-volt oil circuit breakers at Torrey Sub-station, **$130,000.**

O., Findlay—SUB-STATION—Ohio Power Co., 301 Cleveland Ave. S. W., Canton, constr. new Liberty Substation (132/33) near here to tie in with 33,000-volt sys. of Central Ohio Light & Power Co. **$680.000.**

▲ **O., Lima** — SUB-STATION — Ohio Power Co., 301 Cleveland Ave. S. W., Canton, addnl. constr. East Lima Sub-station, (330/132). **$1,790,000.**

▲ **O., Muskingum** — AUTO-TRANSFORMER, etc. — Ohio Power Co., 301 Cleveland Ave. S. W., Canton, install 330,000-volt auto-transformer, three 330,000-volt oil circuit breakers, 330,000-volt bus changes; 132,000-volt oil circuit breaker for sleet melting. **$1,730.000.**

▲ **Tex., San Antonio**—GAS PLANT, TRANSFORMER, etc.—City P. Service Bd., 201 N. St. Marys St., gas plant expansion and imprvs., **$475,000;** No. 1, transformer unit, **$575,000;** No. 2, constr. transformer unit, **$375,000;** initial constr. on Unit No. 2, electric power plant on Northside, **$2.000.000;** No. 3, constr. electric transformer unit, **$400.000;** electric power plants imprvs., **$575,000;** gas mains in residential and business sections, **$700,000;** new gas mains to new subdivisions, primarily, **$900.000;** rehabilitation work on existing gas distr. sys. **$650,000;** cathodic protection for gas mains, **$110,000;** gas meter units, **$195,000;** constr. electric power lines in outlying and subdivisions (mostly pole lines), **$775,000;** rehabilitation imprvs. to electric distr. lines in city, **$750.000;** new electric transmission lines **$725,000;** some underground electric cable lines, **$1,000.000** for 1954. CD 6/4.

Utah, Salt Lake City—RECREATION CENTER—McCullough Recreation Co., Dooley Bldg., Salt Lake City, recreation center, **$500.000.**

W. Va., Graham—OIL CIRCUIT BREAKERS—Ohio Power Co., 301 Cleveland Ave. S. W., Canton, O. complete installation nine 138.000-volt oil circuit breakers, Philip Sporn Plant. **$527,000.**

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

STREETS AND ROADS

March 29 Connecticut — March 31 New Hampshire

† **Mass., Chicopee Falls**—HEATING PLANT—B.A. On Or About 4/16—U. S. Eng., 857 Commonwealth Ave., Boston, Zone 15, central high pressure hot water heating plant and distr. sys., Westover Air Force Base. $750,000-$1,250,000. Plans deposit $10.

BIDS ASKED—BUILDINGS

R. I., Pawtucket—CHURCH—B.A. 3/30—At office William M. O'Rourke, archt., 10 Child St., Warren, brick, concrete, steel, limestone trim church, Park St for Church of The Sacred Heart, Pastor Rev. Robert Cassidy, 38 Park St., Pawtucket. $800,000. Plans deposit $50. CD 9/1.

▲ **Mass., Worcester**—COURT HOUSE—B.A. 4/15—Worcester Co., Court House, 2 Main St., court house annex, Highland and Harvard Sts. $2,500,000. Plans deposit $50, refundable. CD 5/2/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **George A. Fuller Co.,** 11 Beacon St., Boston, Mass. LB **$833,751,** automotive maintenance shop and A.I.O. Compound, Portsmouth Air Force Bsae, ENG-19-016-54-67, PORTSMOUTH, N. H. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Mar. 11. CD 2/17.

▲† **Robert A. Verrier Constr. Co.,** 65 Commercial St., Portland, Me.; CA **$1,587,576.** water supply, off base, Portsmouth Air Force Base, ENG-19-016-54-61, PORTSMOUTH, N. H. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Feb. 24, awarded Mar. 11. CD 3/2, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **G. L. Rugo & Sons, Inc.,** 80 Boylston St., Boston, Mass. LB **$1,194,000.** HIGH SCHOOL, Central and William Sts., STONEHAM, MASS. Town, School Bldg. Comn., Central St., Stoneham, Mass. Bids Mar. 11. CD 2/24.

Frouge Constr. Co., Inc., 74 Goodsell St., Bridgeport, Conn., LB, **$837,000** Hayestown SCHOOL, off Hayestown Ave., DANBURY, CONN. Town School Bldg. Comn., 20 West St., Danbury, Conn. Bids Mar. 11. CD 3/1.

▲ **Wadhams & May,** 15 Lewis St., Hartford, Conn., LB, **$2,213,346,** Battell Hall Continued TREATMENT BLDG. for Women, State Hospital, Proj. B/A-I-105, MIDDLETOWN, CONN. State P. Wks. Comr., State Office Bldg. Hartford, Conn. Bids Mar. 10. CD 2/2.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

April 2, 9 Pennsylvania — April 6 Maryland

STREETS AND ROADS

March 30 Maryland — April 2, 9 Pennsylvania
April 6 New Jersey — April 8 New York

▲ † **N. Y., Plattsburg**—DORMITORY, MESS—B.A. 5/4—U. S. Eng., 80 Lafayette St., New York, Zone 13, AM dormitory, mess, commissary bldg., and AIO warehouse, FY 1953, 1954 at Plattsburg Air Force Base. $1,000,000-$3,000,000. Extended date., CD 12/18.

BIDS ASKED—BUILDINGS

▲ **N. Y., Brooklyn**—PRISON—B.A. 4/21—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, general constr.; plumbing; heating, ventilating and refrigeration work; electrical work for constr. City Prison and Remand Shelter Atlantic Ave., Boerum Pl., Smith and State Sts., Brooklyn Boro. Plans deposit $100. CD 8/7/50, under LB.

▲ **N. Y., West Point**—BARRACKS—B.A. 6/2—U. S Eng., 80 Lafayette St., New York Zone 13, rehabilitation cadet barracks at United States Military Academy $500,000-$1,000,000. Greenberg & Ames, 303 Fourth Ave., New York Zone 10, archts. CD 10/10/46.

SOON LETS CONTRACT—BUILDINGS

Pa., Phila.—CLASSROOM—At office Dagit & Sons, archts., 1329 Race St., soon lets contract classroom for Sisters of the Holy Family of Nazareth, Grant and Frankford Aves. $750,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Ferngate Constr. Corp.,** 1142 Ferngate Dr., Franklin Square, N. Y., LB **$399,529,** sewers, 77 Ave., Vleigh Pl., etc.;

Spearin, Preston & Burrows, Inc., 50 Church St., New York 7, N. Y., LB **$1,183,697,** sewers, Little Neck Bay, 35 Ave., 208 St., etc.;

Federico Contr. Co., Inc., 1955 W. 5 St., Brooklyn 23, N. Y. LB **$100,480,** sewers, Broadway, Judge St., etc., Queens Boro, NEW YORK. President Queens Boro, Queens Boro Hall, 120-55 Queens Blvd., Kew Gardens 24, N. Y. Bids Mar. 11. CD 2/25.

▲† **Philban Co.,** 152 W. 42 St., New York 38, N. Y. CA **$1,269,535,** barracks, A/C fuel storage, parking apron and mess hall, Hancock Field, Air National Guard Facilities, FY 1954, Serial No. Eng-30-075-54-139, SYRACUSE, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids Feb. 25. CD 1/21.

BUILDINGS

LOW BIDS AND CONTRACTS

Kentwood at Huntington Homes, c/o Stanley Shaftel, archt., 89-47, 163 St., Jamaica, N. Y. Owner Builds. **$900,000.** 75 HOUSES, E. 23 St. and Thorney Ave., HUNTINGTON, N. Y.

Hallmark at Huntington Homes, c/o E. J. Cappello, archt., 45 Middleneck Rd., Great Neck, N. Y. Owner Builds. **$800,000.** 60 HOUSES, Semon Rd. and New York Ave., HUNTINGTON, N. Y.

▲ **Walsh Constr. Co.,** 122 E. 42 St., New York 17, N. Y., **George A. Fuller Co.,** 597 Madison Ave., New York 22, N. Y., and **Slattery Contg. Co.,** 46-39 54th Rd., Maspeth, N. Y. CA Approx. **$26,000,000.** New York COLISEUM CONVENTION HALL and EXHIBITION HALL, incl. 22 story office bldg., Columbus Circle, NEW YORK, N. Y. Triborough Bridge & Tunnel Auth., Randalls Island, New York, N. Y. Leon & Lionel Levy, 158 E. 35 St., New York, N. Y., archts. Aymar Embury II, 150 E. 61 St., New York, N. Y., Eggers & Higgins, 100 E. 42 St., New York, N. Y. and John B. Peterkin, 36 W. 44 St., New York, N. Y., consult. archts. CD 3/11.

Joseph Brunetti, 918 Alwood Rd., Clifton, N. J., CA, **$900,000,** 48 HOUSES on tract at Radburn Rd. and High St., FAIRLAWN, N. J.

▲ **Levitt & Sons, Inc.,** 1616 Northern Blvd., Manhasset, N. Y., Owner Builds. **$66,000,000.** HOUSING, 1954-55 program, LEVITTOWN, PA.

▲ **Baton Constr. Co.,** 1717 Sansom St., Phila., Pa. CA Approx. **$1,500,000.** department STORE and parking area, PHILA., PA. Sears Roebuck & Co., 4640 Roosevelt Blvd., Phila., Pa. Bids Jan. 25. CD 2/3.

▲ **Westinghouse Electric Corp.,** Union Bank Bldg., Pittsburgh, Pa., CA. Total est. **$5,000,000.** pressure water reactor GENERATING STATION, PITTSBURGH, PA. Duquesne Light Co., 435 Sixth Ave., Pittsburgh 6, Pa. Duquesne Light Co., is negotiating agreement with Atomic Energy Commission, for construction and operation of first full scale central station nuclear power plant.

James Sorber, R. D. 2, West Chester, Pa. Separate Contracts. **$750,000.** RESIDENTIAL DEVELOPMENT, Greenback Ave., WEST CHESTER, PA.

▲ **Cafritz Co.,** 1404 K St. N.W., Wash., D. C. Own Forces. **$2,000,000.** SHOPPING CENTER, Hugh O'Neill Estate near intersection of Defense Hy. and Landover Rd., LANDOVER, MD. Leroy Werner, 1404 K St. N.W., Wash., D. C., archt. CD 4/23.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

April 14 Louisiana

STREETS AND ROADS

April 14 Louisiana

BIDS ASKED—BUILDINGS

▲ **Ga., Greenville**—SCHOOLS—B.A. 4/13—Meriweather Co. Bd. Educ., Greenville, Consolidated School $500,000. Hall, McEwen & Ferguson, Bankers Insurance Bldg., Macon, archts.; training school, Manchester, $500,000, W. L. Keel, 843 Peachtree St. N.E., Atlanta, archt. CD 8/28/52.

▲ **Tenn., Memphis**—TRUCK TERMINAL—B.A. 5/15—City, City Hall, River-Rail-Truck Terminal on President's Island. $1,000,000. Norton & Rice, Falls Bldg., archts. CD 3/13/52.

SOON LETS CONTRACT—BUILDINGS

▲ **Ga., Atlanta**—HOTEL—Dinkler-Plaza Hotel, Forsyth St., soon lets contract hotel addn. Over $1,000,000. Plans deposit $1.00. Alexander & Rothschild, 316 Peachtree St., archts. CD 2/16.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Mechanical Eng. Corp.,** 232 Bank St., Norfolk, Va. LB **$898,496.** electrical distr. sys. and sub-stations, Naval Amphibious Base, NOY 78215, LITTLE CREEK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. Bids Mar. 16. CD 3/11.

▲† **A. G. Pinkston Co.,** 1805 County St., Portsmouth, Va. LB **$1,325,000.** steam distr. sys., Naval Amphibious Base, NOY 78216, LITTLE CREEK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. Bids Mar. 16. CD 3/11.

Intercounty Constr. Co., P.O. Box 1640, Fort Lauderdale, Fla., CA, **$943,840,** Lawrence Storm Sewer in District SR-327, MIAMI, FLA. City Dpt. Eng., 3332 Pan American Dr., Miami, Fla. Bids Feb. 17. CD 2/25, under LB.

▲ **ALABAMA**—State Hy. Dpt., Mobile,

Blount Bros. Constr. Co., P.O. Box 1144, Montgomery, Ala., CA, **$2,445,774.** spans and timber bulkheads for Dauphin Island Bridge, 3.014 mi. S-624 Mobile Co. Bids Mar. 5, awarded Mar. 10. CD 2/25.

BUILDINGS

LOW BIDS AND CONTRACTS

Sawyer Constr. Co., P.O. Box 179, Hampton, Va., CA **$819,500,** fire rebuilding and addns., Newport News HIGH SCHOOL, NEWPORT NEWS, VA. Newport News School Bd., 222 32nd St., Newport News, Va. Bids Feb. 10. CD 2/16, under LB.

▲ **Doyle & Russell,** Central Natl. Bank Bldg., Richmond, Va., CA. **$3,686,340.** Tuberculosis SANITARIUM and St. Philip HOSPITAL, RICHMOND, VA. Medical College of Virginia, 1200 E. Broad St., Richmond, Va. Bids Jan. 20. CD 1/26, under LB.

▲ **J. A. Jones Constr. Co.,** 209 W. 4 St., Charlotte, N. C. CA. Approx. **$2,000,000.** rein.-con., masonry specialty CONTROL PLANT, WAYNESBORO, VA. General Electric Co., River Rd., Schenectady 5, N. Y. Bids Mar. 9. CD 2/26.

▲ **J. A. Jones Constr. Co.,** 133 Ellis St. N.E. Atlanta, Ga., CA, **$1,250,000** PLANT, ATLANTA, GA. H. W. Lay & Co., Inc., 1704 Portland Ave., Nashville, Ten. CD 12/29.

▲ **Mion Constr. Co.,** 377 Techwood Dr., Atlanta, Ga. CA, **$1,400,000,** Doctor's OFFICE bldg., ATLANTA, GA. Georgia Baptist Hospital, 300 Boulevard Ave. N.E., Atlanta, Ga. CD 11/24/52.

S. J. Curry & Co., Albany, Ga., CA, **$754,417** (1) White ELEMENTARY-HIGH SCHOOL addn. (2) Negro HIGH SCHOOL, FORT GAINES, GA. Clay Co. Bd. Educ., Fort Gaines, Ga. Bids Mar. 9. CD 2/17.

Batson-Cook Co., West Point, Ga., CA, **$890,770** (1) Negro HIGH SCHOOL (2) Southeast ELEMENTARY SCHOOL, DECATUR, ALA. City, Bd. Educ., Decatur, Ala. Bids Mar. 3. CD 1/26.

▲ **H. L. Coble Constr. Co.,** P.O. Box 2040, Greensboro, N. C., CA, **$1,250,000** MILL, SCOTTSBORO, ALA. Burlington Mills, Empire State Bldg., 300 Fifth Ave., New York, N. Y. CD 3/9.

▲ **M. T. Reed Constr. Co.,** P.O. Box 1066, Jackson, Miss. CA Est. **$1,000,000.** packing PLANT, JACKSON, MISS. Swift & Co., Union Stockyards, Chicago, Ill. Bids Feb. 23. CD 2/9.

▲ **Gurtler, Hebert & Co.,** P.O. Box 8066, New Orleans, La. CA Est. **$1,000,000.** second addn., 117 RESIDENCES to Arabi Park subdivision, ARABI, LA. Delcuze Real Estate Co., Arabi, La.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

April 6 Wisconsin

STREETS AND ROADS

March 30 Ohio — April 6 Wisconsin

O., Columbus—B.A. 3/30—City, City Hall, imprv. 17 streets and alleys. $750,000. CD 7/24.

BIDS ASKED—BUILDINGS

▲ **Wis., Milwaukee**—HOSPITAL—B.A. 4/2—St. Francis Hospital Corp., 3249 S. 18 St., hospital. $5,000,000. Plans deposit $50. Extended date. Francis S. Gurda, 1015 W. Mitchell St., archt. CD 2/8.

Ill., Hinsdale—SCHOOL—4/5—School District 86, 55 and Grant Sts., 2 story bsmt. high school, $900,000. Fugard, Burt Wilkinson & Orth, 520 N. Michigan St., Chicago, Zone 11, archts. CD 4/30.

▲ **Mich., Alma**—HOSPITAL—B.A. 4/14—Gratiot Community Hospital, City Hall, Alma, brick, steel, concrete medical hospital, $1,125,000. Plans deposit $25, Clark R. Ackley, 1811 E. Michigan Ave., Lansing, archt. CD 2/12/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Charles H. Shook, Inc.,** 582 W. 2nd St., Dayton 1, O. LB **$1,322,285,** est. $1,230,000. 6 m. g. Southworks Water Treatment Plant, E. River Rd. HAMILTON, O. City, City Hall, Hamilton, O. CD 1/19.

▲ **Commercial Contg. Corp.,** 12160 Cloverdale St., Detroit, Mich. CA Est. **$1,000,000,** industrial waste treatment plant, to remove impurities from liquid waste at Rouge Plant, DEARBORN, MICH. Ford Motor Co., 300 Schaefer St., Dearborn, Mich. Hubbell, Roth & Clark, Inc., 2640 Buhl Bldg., Detroit, Mich., consult. engr.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Wright Homes, Inc.,** c/o Edward Rose & Sons, 14900 Linwood St., Detroit, Mich. Owner Builds. **$1,150,000.** 92 ranch-style HOMES, south of Page Manor Apartment Proj., east of DAYTON, O.

▲ † **Sollitt Constr. Co.,** 301 Columbia St., South Bend, Ind., CA, **$2,500,000,** FACTORY and OFFICE MISHAWAKA, IND. Bendix Products Div., Bendix Aviation Corp., D. A. Campbell, dir. Purchases, Mishawaka, Ind. Bids Mar. 2, awarded Mar. 10. CD 2/24.

Green & Gust, 1635 W. Grace St., Chicago, Ill., CA, **$736,310,** DORMITORY on campus, CHICAGO, ILL. Loyola University, 6525 N. Sheridan Ave., Chicago, Ill. Bids Mar. 2, awarded Mar. 5. CD 3/10, under LB.

▲ **Practical Home Builders, Inc.,** 13440 W. 7 Mile Rd., DETROIT, MICH. Owner Builds. **$1,100,000.** 95 addnl. brick HOMES in Nine Mile Rd., Saxony and Gratiot Project, EAST DETROIT, MICH.

Over 85% of the torque wrenches used in industry are
Sturtevant
TORQUE WRENCHES
Read by Sight, Sound or Feel.
Permanently Accurate
Practically Indestructible
Faster—Easier to use
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ADDISON QUALITY ILLINOIS

McKIERNAN-TERRY

Ruggedly-Built

PILE EXTRACTORS

Provide exceptional pulling power, with the sharp energy of blow needed to vibrate and loosen stubbornly set piling. These double-acting extractors come in two standard models—heavy and extra heavy. Standardized line also contains 11 double-acting hammers and 5 single-acting hammers. Write for free bulletin.

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Manufacturing Engineers

13 Park Row New York 7, N. Y.

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DRIVEN FOR EVERY CONDITION
FOR EVERY STRUCTURE

MacArthur Concrete Pile Corp.

18 East 48th Street New York 17, N. Y.
New Orleans Cincinnati Pittsburgh
PILE DRIVING CONTRACTORS SINCE 1910

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

April 1 Kansas April 14 Texas

STREETS AND ROADS

April 1 Kansas April 13, 14 Texas

BIDS ASKED—BUILDINGS

▲† **N. M., Los Alamos**—HOUSING—B.A. 4/6—U. S. Atomic Energy Comn., c/o Ch. of Procurement Sec., Los Alamos Field Office, Los Alamos, A.E.C. Group 16, constr. 122 single, 2, 3, and 4-bedroom housing units, 1 story, wood frame, poured concrete fdns., some bit. paving, Inv. No. 291-54-10. $1,000,000. Extended date. CD 2/19.

▲ **Mont., Billings**—BANK and OFFICE—B.A. 4/28—Midland National Bank, Billings, (selected list bidders) 8 story, 85x140 ft., rein.-con., L-shaped bank and office, $2,000,000, Orr Pickering & Assoc., Fratt Bldg., archts. CD 2/17.

SOON LETS CONTRACT—BUILDINGS

▲ **Minn., St. Paul**—Great Northern Oil Co., W. J. Carthaus, pres., First National Bank Bldg., soon lets contract oil refinery, near South St. Paul. $20,000,000. CD 2/19.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **V. & M. Contg. Co., Inc.**, 4030 Chouteau Ave., St. Louis 10, Mo. LB **$766,050.** general contract;
American Power Piping Corp., 820 Security Bldg., St. Louis 2, Mo. LB **$687,800.** heating, ventilating and air-conditioning;
Corrigan Co., 2525 St. Louis Ave., St. Louis 6, Mo. LB **$136,714.** plumbing and drainage;
John Ledbetter Electric Co., 1919 Olive St., St. Louis 3, Mo. LB **$379,280.** electrical sys.;
Otis Elevator Co., 2301 Locust St., St. Louis 3, Mo. LB **$71,933.** escalator installation for Part 2 boiler and shops bldg., an airline service bldg., cargo bldg., 3-passenger fingers for terminal bldg., at Lambert-St. Louis Municipal Airport, Robertson, ST. LOUIS, MO. City, Bd. P. Service, Frank J. McDevitt, pres., 304 City Hall, St. Louis 3, Mo. Bids Mar. 9. CD 2/19.

▲ **ARKANSAS**—State Hy. Comn., State Capitol, Little Rock,
Reynolds & Williams, 3200 Brown St., Little Rock, Ark. LB, **$741,356**, wid'n., b. conc. resurf. State Hy. 70, Job 6430, Pulaski County Line—Carlisle Rd., LB **$610,918**, 6.762 mi. Job 3427, Texarkansas-Paups Spur, Miller Co.,
McGeorge Constr. Co., foot of Nebraska St. Pine Bluff, Ark., LB, **$329,127**, 10.054 mi. State Hy. 31, Coy-North, Lonoke Co.;
W. R. Fairchild Constr. Co. Ltd., Hattiesburg, Miss., LB, **$301,746**, 3.704 mi. State Hy. 4, Job 7434, Calhoun and Bradley Counties;
Steinberg-Boyd Constr. Co., 1514½ S. 79 E Ave., Tulsa, Okla., LB, **$265,509**, 11.496 mi. Job 6462 Des Arc, White Co. Bids Mar. 11. CD 3/8.

▲† **Peter Kiewit Sons Co.**, 1024 Omaha Natl. Bank Bldg., Omaha, Neb., CA **$1,647,278.** multi-purpose docks, Ellsworth Air Force Base, Inv. 25-066-54-4, RAPID CITY, S. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Mar. 2. CW 3/5, under LB.

▲† **R. G. LeTourneau, Inc., Longview, Tex.**, CA **$2,016,882**, Items 1, 3, 4, 5, 6 for relocation St. Louis Southwestern Ry. embankment between Texarkana and Naples, in Bowie and Cass Counties, Inv. No. 54-112, TEXAS. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Feb. 2. CD 2/10, under LB.

▲† **J. J. Fritch Constr. Co.**, 6834 Harry Hines Blvd., Dallas, Tex., LB, **$2,015,612**, est. $1,917,016, constr. 100/200 bed hospital and facilities, Wolters Air Force Base, Inv. ENG-41-443-54-30, MINERAL WELLS, TEX. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex. Bids Mar. 11. CD 2/3.

▲ **NEW MEXICO**—State Hy. Comn., Capitol Bldg., Santa Fe,
Brown Constr. Co., 3525 N. 4 St., Albuquerque, N. M., LB **$647,681**, 22.137 mi. N. M. Proj. F-052-1 (2) and St. Proj. No. F-052-1 (400), Cebolla-Chama, Rio Arriba Co.;
Skousen Constr. Co., Springer Bldg., Albuquerque, N. M. LB **$386,495**, 9.565 mi. N. M. Proj. No. S-1326 (1), Blanco-East, San Juan Co. Bids Mar. 12. CD 3/4.

BUILDINGS

LOW BIDS AND CONTRACTS

Millstone Constr. Inc., 4343 Clayton Ave., St. Louis 10, Mo. CA **$844,700.** 1 and 3 story, ground floor, 76x298 ft., 140x141 ft., L-shaped brick, rein.-con., steel SCHOOL in Housing Area M-1-4, at 1212 N. 22 St., ST. LOUIS, MO. Bd. Educ., V. Harry Rhodes, comr. School Bldgs., 911 Locust St., St. Louis 1, Mo. Bids Mar. 1, awarded Mar. 9. CD 3/8 under LB.

C. S. Lambie & Co., Box 1167, Amarillo, Tex., CA **$933,150** Junior HIGH SCHOOL, AMARILLO, TEX. Amarillo Independent School Dist., Amarillo, Tex. Bids Mar. 9. CD 3/16, under LB.

▲ **H. K. Ferguson Co.**, 1783 E. 11 St., Cleveland, O. CA Approx. **$1,000,000.** PLANT addn., DALLAS, TEX. Procter & Gamble, 1226 Loomis St., Dallas, Tex. CD 3/15.

▲ **Manhattan Constr. Co.**, 2828 Pease St., Houston, Tex. CA **$1,800,000.** constr. all interior work of new CLUB BLDG., HOUSTON, TEX. Houston Club Building, c/o J. Russ Baty; Lamar Annex, and Wilson, Morris & Crain, 420 Sul Ross St., Houston, Tex. archts. CD 3/9, under LB.

▲ **Hutter Constr. Co.**, 134 Western Ave., Fond du Lac, Wis., CA. **$2,500,000.** general contract HOSPITAL addns., 4 story, bsmnt., east wing, north-south wing; 3 story west wing; concrete skeleton, face brick with terra cotta and granite trim, ROSWELL, N. M. Sisters of The Sorrowful Mother, Sister M. Borgia, Superior, St. Mary's Hospital, Roswell, N. M. Hugh Rowland, 125 W. Walnut St., Roswell, N. M., archt. Lafayette McKay, Lubbock, Tex., mech. engr. CD 12/11.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

April 6 Idaho April 7 California

STREETS AND ROADS

April 1 Nevada April 7, 8 California

▲ † **California**—B.A. 4/8—U. S. Eng., 751 S. Figueroa St., Los Angeles, Los Angeles River Imprvt. from Reseda Blvd. to Sepulveda Flood Control Basin, Reseda, $2,800,000. CD 12/17/52.

▲ † **California**—B.A. 4/15—U. S. Eng., 751 S. Figuero St., Los Angeles, imprv. Rio Hondon Channell, Washington Blvd. to Santa Ana Freeway, Downey, Los Angeles Co. $2,000,000. CD 12/17/52.

BIDS ASKED—BUILDINGS

Wash., Seattle—SCHOOL—B.A. 4/6—School District No. 1, 805 4 Ave. N., 1 story, 85x275 ft. and 50x70 ft. rein.-con. Wedgwood Elementary School in northeast part of city, $800,000. Plans deposit $25. John Graham & Co., Dexter Horton Bldg., Zone 4, archts. CD 3/15.

SOON LETS CONTRACT—BUILDINGS

▲ **Wash., Seattle**—PARKING GARAGE—System Garages, Inc., 601 Olive Way, soon lets contract 2400 car rein.-con. parking garage, first unit of 4,000 car project, $1,500,000. Olsen & Kitchen, 1411 4th Ave. Bldg., Zone 1, engrs. Stiles Clements, 210 W. 7 St., Los Angeles, Calif., archt. CD 11/13.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,
Clements Constr. Co., P.O. Box 667, Centerville, Calif., LB, **$94,460**, 4.9 mi. Alameda Co.;
Gallagher & Burk, Inc., 344 High St., Oakland, Calif., LB, **$262,874**, 0.3 mi. and 1 steel girder and rein.-con. slab bridge near Pittsburg, Contra Costa Co.;
McCammon & Wunderlich, P.O. Box 359, Palo Alto, Calif. LB, **$737,452**, 6.7 mi. Del Norte Co.;
Gordon H. Ball, San Ramon Valley Land Co., Camille Ave., Danville, and **John Delphia**, P.O. Box 213, Patterson, Calif., LB, **$1,926,723**, 5.4 mi. and 2 rein.-con. bridges, 1 prestressed bridge between Harnell Rd. and E. Market St., Monterey Co.;
Nomellini Constr. Co., P.O. Box 1177, Stockton, Calif. LB, **$115,577**, 3 mi. Holt St. and Rt. 4, San Joaquin Co.;
Lee J. Immel, 3030 San Pablo Ave., San Pablo, Calif., LB, **$68,920**, 1.6 mi. Solano Co.;
Frederickson & Watson Constr. Co., 873 81 Ave., Oakland, Calif., LB, **$587,777**, 12.2 mi. Tehama Co. Bids Mar. 10. CD 2/17.

BUILDINGS

LOW BIDS AND CONTRACTS

Purvis Constr. Co., S 702 Washington St., Spokane, Wash., CA, **$936,270**, 4 story HOSPITAL addn., SPOKANE, WASH. Deaconess Hospital, Spokane, Wash. Bids Jan. 14. CD 1/21, under LB.

▲ **John J. Moore Co.**, 959 33 St., Oakland, Calif., CA, **$3,000,000** design and construct 25 story OFFICE, 3 STORES and 3-deck GARAGE, OAKLAND, CALIF. MacArthur Properties, Inc., 3660 Broadway, Oakland, Calif.

▲ **Swinerton & Walberg**, 225 Bush St., San Francisco, Calif., **$2,118,843**, Serra High SCHOOL, SAN MATEO, CALIF. Roman Catholic Archbishop, 1100 Franklin St., San Francisco, Calif. Bids Mar. 2, awarded Mar. 12. CD 3/10, under LB.

CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **James Kemp Constr.**, 121 Vansitmart St., Hamilton, Ont., LB, Est. **$3,000,000.** HIGH SCHOOL, East 15 St. and South Bend Rd., HAMILTON, ONT. Hamilton Bd. Educ., 367 Hunter St., Hamilton, Ont. Bids Feb. 24. CD 2/8.

LATIN AMERICA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Jorge Dominguez**, Hotel Regis, Mexico City, Mexico, CA $2,910,000. 21 story HOTEL, MEXICO CITY, MEXICO. Anarcasis Peralta, Hotel Regis, Mexico City, Mexico. Awarded Mar. 13. CD 8/18/50.

(Proposal Advertisements see pp. 80 to 83)

UNIT PRICES

Nevada bids close on highway job

Silver State Construction Co., Fallen, Nevada, underbid their nearest rival by less than one-half of one percent to take a $720,252 highway improvement contract awarded by the Nevada State Highway Department. H. D. Mills is state highway engineer, J. D. Mecham is construction engineer and D. Rose, resident engineer.

Work consists of grading the roadbed, widening bridges, installing drainage structures and lighting system, and constructing a class F-2 Plantmix surface with a class A-1 surface treatment. Approximately 10 miles of the highway will be under construction.

The three bridges to be widened include two with concrete decks on treated timber piles and one concrete structure.

Borrow will be obtained from sand dunes in fields adjacent to the road and such pits must be graded to the level of the fields.

The average daily traffic of 1,300 vehicles will be carried through the construction for the entire length of the job.

Wage rates are: skilled labor, $2.00 per hr; semi-skilled labor, $1.85 per hr; and common labor, $1.75 per hr. The project started February 5 and will take 200 working days. Rail and highway transportation are available to the site. Bidders include:

1C	Silver State Const. Co., Fallon, Nevada	$720,252
2	Dodge Const., Inc., Fallon, Nevada	722,512
6	Isbell Const. Co., Reno, Nevada	908,795

Bids: 1-21-54 Items	Unit	Quantity	Unit Prices 1 C	 2
Signs	ls	1	$2,000	$2,000
Pilot car	hr	50	3.00	4.00
Flagman	hr	4,800	1.75	2.10
Rem trees, 7″ to 12″	ea	47	15.00	25.00
1′-1″ to 2′	ea	67	40.00	30.00
2′-1″ to 3′	ea	10	50.00	50.00
3′-1″ to 4′	ea	2	100.00	75.00
over 4′	ea	2	100.00	100.00
Remove stumps	ea	6	25.00	50.00
Trim trees	fa	1	500.00	500.00
Remove fence	lf	47,905	0.05	0.05
Remove concrete	cy	42	42.00	25.00
Remove culvert pipe	lf	3,927	1.50	1.50
Remove headwalls	ea	11	20.00	15.00
Remove timber bridge	ea	2	500.00	500.00
Remove timber structures	ea	68	60.00	20.00
Remove conc sidewalk	sy	79	0.25	1.50
Roadway excavation	cy	159,724	0.23	0.22
Drainage excavation	cy	2,710	0.27	0.50
V-type ditches	sta	69	6.00	5.00
Borrow	cy	348,690	0.19	0.23
Overhaul	ydsta	1,771,604	0.015	0.01
Overhaul	ydmi	526,041	0.12	0.15
Structure excavation	cy	5,770	1.50	1.70
Backfill	cy	7,690	1.00	1.00
Water	mgal	21,653	1.00	0.75
Furnish water equip	ls	1	3,000	5,400
Power roller	hr	569	5.00	6.00
Tamping or pneumatic-tired roller	fthr	27,425	0.50	0.50
Gravel base, type 1	t	65,590	0.85	0.80
type 2-1″	t	45,930	0.95	1.00
Liquid asph, MC-1 prime	t	378	35.00	35.00
Sand blotter	t	633	2.00	2.00
Emulsified asphalt, type RS-2, seal	t	253	40.00	34.00
Screenings, ½″	t	1,377	3.00	3.50
Asph cmt, 150-200 pen.	t	1,704	30.00	29.00
Plantmix surface, class F-2	t	30,980	2.60	2.40
Concrete, class AA	cy	748	70.00	63.50
Reinforcing steel	lb	116,270	0.10	0.12
Str stl rail, type B	lf	49 33	8.00	7.50
type D	lf	89 33	10.00	11.00
Rem & reset str stl rail	lf	47	3.00	5.00
Treated douglas fir	mfbm	0.379	300.00	300.00
Treated timber piles	lf	1,090	2.00	1.75
Drive timber piles	ea	43	50.00	40.00
Corr met pipe, dipped, 15″	lf	34	3.00	3.50
18″	lf	1,664	4.00	3.75
24″	lf	4,548	5.00	5.50
30″	lf	164	8.00	7.25
36″	lf	280	10.00	11.00
42″	lf	68	12.00	12.75
Corr met arch pile, dipped 43″x27″	lf	40	12.00	14.00
50″x31″	lf	1,410	12.00	16.00
Corr met siphon pipe, dipped 18″	lf	96	5.00	6.00
24″	lf	36	7.00	8.50
30″	lf	136	9.00	10.00
Nestable corr met pipe, dipped, 8″	lf	36	2.00	2.25
Relay culvert pipe	lf	445	1.50	1.50
Move pipe culv headwalls	ea	1	25.00	30.00
Cl AA conc curb & gutter	cy	230	60.00	32.50
Structural steel	bl	4,819	0.25	0.36
Bituminous footpath	sy	367	0.50	1.50
Beam type guard rail, type A	lf	290	5.00	4.50
Culvert markers & guide posts	ea	432	6.00	6.00
Construct fence, A-26-3B	lf	7,645	0.34	0.30
B-26-3B	lf	8,040	0.34	0.25
C-26-3B	lf	20,065	0.34	0.25
A-32-3B	lf	24,270	0.34	0.30
C-32-3B	lf	2,070	0.34	0.25
Reconstruct fence	lf	625	0.25	0.15
Metal gate' 16′	ea	54	60.00	55.00
Reference monuments	ea	56	6.00	7.50
Right-of-way markers	ea	24	6.00	6.00
Miscellaneous work	fa	1	150.00	150.00
Sewer pipe, OB, 4″	lf	336	1.00	1.25
Std met headwall, dipped, 18″	ea	24	40.00	32.00
Metal headgate, 18″	ea	4	60.00	55.00
36″	ea	1	200.00	175.00
i60″x36″	ea	1	200.00	165.00
Hghway lighting system	ls	1	75,00	6,500

Eighteen bids closely bunched for Oklahoma dam

Less than 3% separated each of the first seventeen of eighteen bidders in tight bidding on a $143,000 dam contract in Pauls Valley, Oklahoma. The contract, part of the Washington Creek Reservoir project, was awarded by the city to Long Construction Co., Morris, Oklahoma. Lee M. Bush & Co., engineers, estimated the cost at 36% above the low bid.

The earth dam will be 3,000-ft long and 37-ft high with a core wall, spillway, and intake tower. An additional contract has been awarded for appurtenant work including 12,000 ft of 14-in. cast iron pipe line crossing under the Wichita River.

Skilled laborers will receive a minimum of $1.75 per hr; and common laborers, $1.00 per hr.

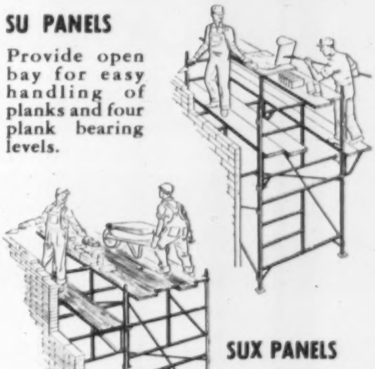
Bidders include:

1C	Long Const. Co., Morris, Oklahoma	$143,030
2	Frix & Foster Const., Muskogee, Oklahoma	151,400
18	Pentzien, Inc., Omaha, Nebraska	358,560
EE	Lee M. Bush& Co., Oklahom City, Oklahoma	194,650

Bids: 2-1-54 Item	Unit	Quantity	Unit Prices 1 C	 2
Embankment	cy	300,000	$0.18	0.20
Core wall excavation	cy	14,000	0.51	0.25
Spillway excavation	cy	25 000	0.12	0.20
Rip-rap	sy	13,000	3.00	3.00
Fert & sprig	sf	1,700	1.00	2.00
Stripping	cy	8,000	0.18	0.20
Intake tower	ls	1	18,165	13,000
Concrete spillway	ls	1	11,840	15,900
Clearing	ac	750	8,745	10,000

Watch Every Buck—
. . . *Carefully!*

Actually it's not how many bucks you shell out on original costs that count—it's *how much do you save* in erection time and in on-the-job performance. Here are the kind of *savings that count:* can you scaffold higher with fewer panels and parts? can you position plank-bearing brackets at intermediate levels? can you place material at hip-level where your mason can work easier and faster? There's one answer . . . you *can* with Universal Ezebilt Mason Panels, and we don't just make the claim—we show you how. You'll have a time-saver, a buck-saver and a life-saver with **UNIVERSAL Ezebilt SCAFFOLDING**



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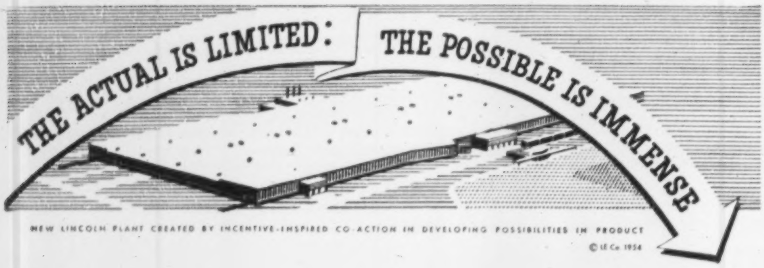

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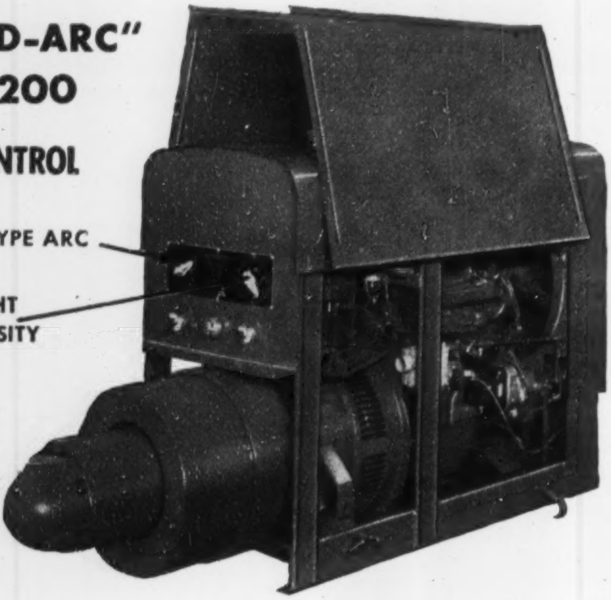
DUAL CONTROL



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FAST, SIMPLE DUAL CONTROL *assures right type* arc and *right arc intensity* for every job. This means that operator can suit the arc to the job every time for flat, vertical or overhead welding.

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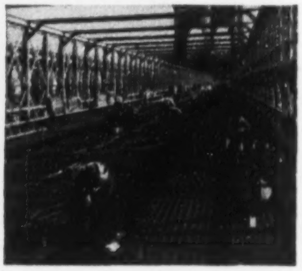
LINCOLN "SHIELD-ARC" for low cost welding

ON MULTI-STORY FRAMEWORK

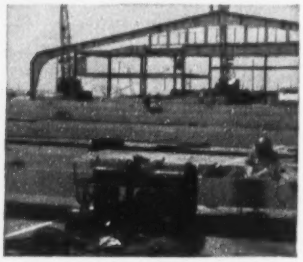
Completing column splices on all-welded multi-story structure. Welds are ⅜" fillets on each side of plate made with 5/32" "Fleetweld 5".

ON BRIDGE CONSTRUCTION



Speeds welding on bridge construction using 20 "Shield-Arc" engine driven welders with 3/16" "Fleetweld" electrodes.

ON WAREHOUSE STRUCTURE



Welding vertically on inside flange of structural framework for 1200 ft. long building. Vertical joints were completed with only four passes with 3/16" "Fleetweld" electrodes and "Shield-Arc" machines.

THE LINCOLN ELECTRIC COMPANY

Dept. 2302
CLEVELAND 17, OHIO
THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

Use of bridge tolls for approaches proposed for Delaware span

Use of part of the income from tolls now being collected on the Delaware Memorial Bridge to finance construction of better approaches to that bridge in Delaware has been proposed by W. A. McWilliams, chief engineer of the Delaware Highway Department. The bridge spans the Delaware below Wilmington and links the south end of the New Jersey Turnpike with main highways to Baltimore and Washington.

The bridge and turnpike have placed an additional traffic load on those Delaware highways. As a result, they are badly overloaded despite the fact that the principal ones have been converted into four-lane divided highways progressively during past years as funds became available. The department does not have the funds to replace them with modern limited-access highways fast enough to meet the growing traffic demand.

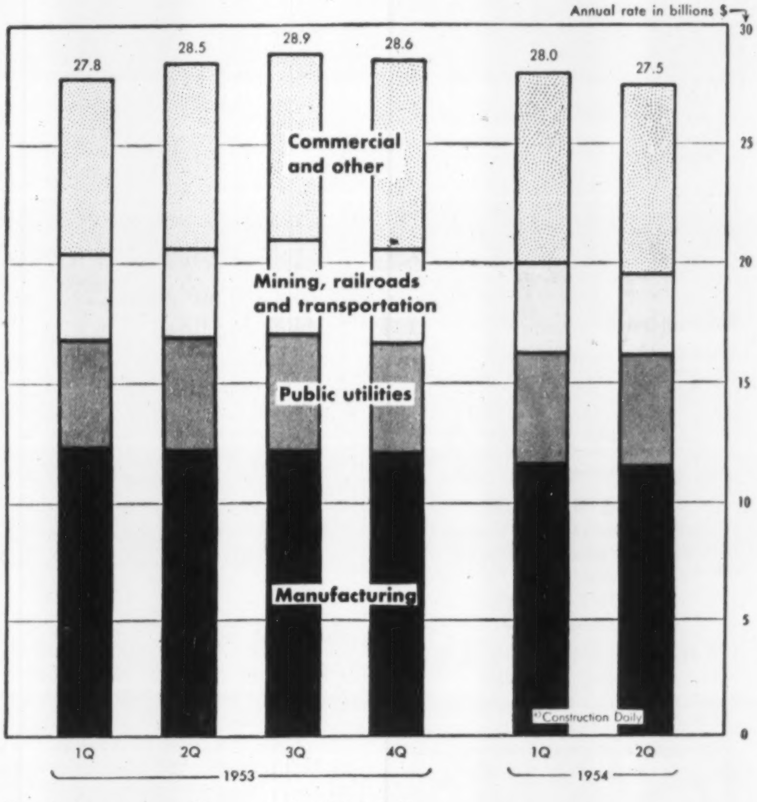
Precedent for what he proposes is found by Mr. McWilliams in the use by the Port of New York Authority of excess income from the Holland and Lincoln tunnels to finance operations that are unrelated to those river crossings.

Also, Congress has authorized continuation of tolls on the Philadelphia-Camden Bridge to assist in financing another bridge between that bridge and the Memorial Bridge.

The Memorial Bridge was completed by Delaware in 1951 at a cost of $45.7 million. The act of Congress authorizing its construction requires that the bonds be retired by the end of 30 years, after which the bridge would become free. These bonds are callable. Income from tolls is so far above interest requirements and operating costs that the state expects to retire $4.5 million in bonds this year. Traffic growth indicates that the retirement rate can be increased in the future.

Instead of paying off the bonds at that fast rate, Mr. McWilliams proposes to issue additional bonds, to be secured by the excess tolls and by continuation of the tolls after the original bonds have been paid off or refunded.

- **Proposed new highways**—Most urgently needed is a limited-access highway extending from the west end of the bridge roughly parallel to U.S. 40 on the present route to Baltimore, also a branch from that route extending south to a link with the Chesapeake Bridge Expressway now being built by Maryland to the Delaware state line. Also under study is a new highway extending northwest past Wilmington to the Pennsylvania line near Hockessin for a better link with the Pennsylvania Turnpike, and a better connection with the Industrial Highway along the Delaware River in Pennsylvania.



Business spending to hold high

Expenditures for new plant and equipment by U. S. businessmen will hold at a high rate through the second quarter of 1954—although the rate will be slightly under 1953 averages—the U. S. Department of Commerce reported last week.

Through the first quarter (January-March) of this year, the spending rate—excluding agricultural and outlays charged to current account—was $28.04 billion. The forecast for the second quarter calls for expenditures of $27.52 billion.

In the first quarter of 1953, spending was $27.84 billion; in the second, $28.48 billion.

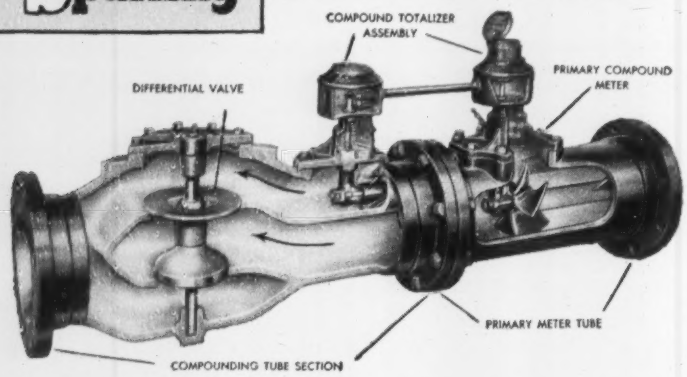
Most of the slight drop is visible in planning for expenditures by manufacturers for plant and equipment. They reported they would spend $11.7 billion for this purpose in the first quarter of 1954, $11.59 billion in the second. A year ago, the manufacturing industry spent $12.35 billion and $12.26 billion in the same period.

Federal-aid hospital plan moves toward Congress OK

President Eisenhower's proposal for expanding the federal-aid hospital program by adding $60 million a year for construction of facilities to take care of chronic, convalescent and elderly patients, plus diagnostic and treatment centers in rural areas, was approved by the House last week, and seems assured of Senate approval.

Cash appropriations will follow enactment of the measure. The President's budget included $60 million for construction assistance in fiscal 1955

Sparling WATER CONTROL EQUIPMENT



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and $2 million to aid state surveys of needs. A supplemental request will ask $650,000 to finance Public Health Service administrative costs—principally to develop design and construction standards for the additional facilities.

- **Some new standards**—State surveys will take an average of six months to complete—depending on ability of each state to match survey funds and to find competent people for the job. The survey will go along with the required annual revision by each state of its hospital survey under the original Hill-Burton program.

Proposed in the bill are yearly authorizations for four types of facilities during the three years, fiscal 1955-57, remaining under the present Hill-Burton program. The total $60-million authorization for each year would comprise $20 million for chronic hospitals, another $20 million for diagnostic and treatment centers, $10 million for nursing homes, and $10 million for rehabilitation facilities. If Congress voted money at the levels proposed for three years, the added facilities would mean about $350 million of new construction.

Housing bond rates drop in N.Y. bidding

With interest rates slightly lower than in previous offerings, 59 local housing authorities last week disposed of bonds totaling $161 million to eight New York City investment banking houses.

The interest rates ranged from .73 to .84%. That compares with rates of .74 to .95%—an average of .8196%—paid for bonds sold February 16.

Business briefs . . .

- **Raymond earnings**—Net income of Raymond Concrete Pile Co., New York foundation and heavy construction firm, was $2.4 million, or $6.16 a share for 1953, the firm reports. The earnings figure compares with $2.6 million, or $6.60 a share for 1952.

- **MC&S earnings up**—Merritt-Chapman & Scott Corp. 1953 net earnings after taxes rose 134% over the preceding year to reach an all-time high of $3.5 million, or $3.96 per share, according to the company's annual report.

- **Profits drop**—Stone & Webster, Inc., reported a consolidated net income of $5.8 million, or $2.75 per share, for 1953, compared with in-

Texas leads nation in '53 construction contracts

Total dollar volume, however, is 7% under '52 record and lowest since 1950 . . . drops of 48% in federal contracts and 32% in industrial building account for most of decline

	1951 52 wks	1952 52 wks (millions)	1953 53 wks	% change based on av. wk. '51-'52	 '52-'53
All construction contracts	**$1,575.7**	**$1,587.1**	**$1,504.4**	+1	−7
By ownership					
Public	**486.6**	**514.8**	**436.3**	**+6**	**−17**
State & municipal	349.3	353.4	350.9	+1	−3
Federal	137.3	161.4	85.4	+18	−48
Private	**1,089.1**	**1,072.3**	**1,068.1**	**−2**	**−2**
By type of work					
Public Works					
Waterworks	37.2	59.8	40.7	+61	−33
Sewerage	43.9	44.8	48.7	+2	+7
Bridges*	12.2	20.1	23.8	+65	+16
Highways	97.7	94.6	104.2	−3	+8
Earthwork; waterways	29.2	20.4	13.9	−30	−33
Buildings	97.4	126.0	103.7	+29	−19
Housing	61.7	49.4	9.6	−20	−81
Unclassified	107.3	99.7	91.7	−7	−10
Private construction					
Industrial building	619.5	557.9	389.3	−10	−32
Commercial building	65.7	43.2	106.8	−34	+143
Mass housing	216.1	313.6	329.7	+45	+3
Unclassified	187.8	157.6	242.4	−16	+51
Backlog of proposed construction, December 31	**$7,228.8**	**$8,304.5**	**$8,635.2**	**+15**	**+4**

*Includes private bridges: $389,000 in '51; $1,050,000 in '52; $375,000 in '53

Texas in 1953 again was the nation's biggest heavy construction state on the basis of contract awards reported to Engineering News-Record, a check showed this week. In 1952, the Lone Star State came in second to Ohio, by virtue of the $1.2-billion AEC Portsmouth plant awards.

But the 1953 figures show that Texas moved back into first place, despite a 48% drop in federal contracts awarded, and dips in both state and municipal private construction.

The biggest factor in the state's construction economy—and a reflection of growing industrialization—was industrial work. At $389 million, Texas accounted for 12% of the total U. S. industrial contracts awarded in 1953. Commercial building in the state picked up sharply, to $107 million for the year—up 143% over 1952. Commercial awards, however, were well under the record $216 million scored in 1950.

Private mass housing showed a slight increase (3%) over 1952, and public works, sewerage, highways and bridge contracts also rose.

A 33% drop in earthwork and waterways reflects the cutback in federal construction contracts during 1953.

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come of $6.2 million or $2.93 per share in 1952. Regarding the report, Whitney Stone, president, commented on slackening of business in the engineering and construction activities of Stone & Webster Engineering Corp., but noted gains in Stone & Webster Service Corp., and improvements in investment banking earnings.

• **Oklahoma bonds due**—Representatives of 21 eastern banking firms recently spent three days as guests of the Oklahoma Turnpike Authority, driving over the existing Turner Turnpike and flying over the 85-mi route of a proposed road. Then they conferred with authority chiefs on dates of bond sales, types of reports they would require, etc.

• **F. H. McGraw shows rise**—F. H. McGraw and Co. has announced a net profit of $185,950 or $.58 per common share for 1953.

• **Bright side**—A bright spot in the 1954 construction picture, says the U. S. Chamber of Commerce, will be commercial construction. The chamber expects this field to hit at least 10% over last year's record $2.2 billion.

PHOTOGRAPH BY RICHARD BEATTIE

What are the facts about cancer of the lung—?

JUST 20 YEARS AGO, in 1933, cancer of the lung killed 2,252 American men. Last year, it killed some 18,500.

WHY THIS STARTLING INCREASE? Our researchers are finding the answers as rapidly as funds and facilities permit —but there isn't enough money.

DOCTORS ESTIMATE that 50% of all men who develop lung cancer could be cured if treated in time. But we are actually saving only 5% . . . just one-tenth as many as we should.

WHY—? Many reasons. But one of the most important is not enough money . . . for mobile X-ray units, for diagnosis and treatment facilities, for training technicians and physicians.

THESE ARE JUST A FEW of the reasons why *you* should contribute generously to the American Cancer Society. Won't you please do it now? *Your* donation is needed—and urgently needed—for the fight against cancer is *everybody's* fight.

Cancer
MAN'S CRUELEST ENEMY
Strike back—*Give*

AMERICAN CANCER SOCIETY
GENTLEMEN:
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☐ Enclosed is my contribution of $........ to the cancer crusade.
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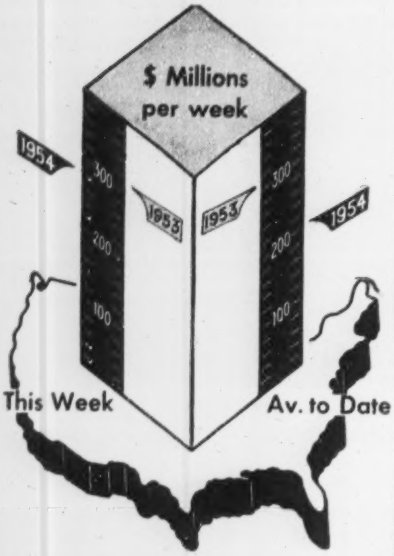
City..............State............
Simply address the envelope: CANCER c/o Postmaster, Name of Your Town

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

	This Week	Cumulative 12 wks 1954	Cumulative 12 wks 1953	% chge
Federal	$21.3	$206.6	$377.7	—45
State and municipal ..	99.0	923.2	1,031.0	—10
Total pub...	120.3	1,129.8	1,408.7	—20
Total priv...	163.3	1,355.8	2,290.8	—41
U. S. total..	**$283.6**	**$2,485.6**	**$3,699.5**	**—33**

Contracts by type of work

	This Week	Cumulative 12 wks 1954	Cumulative 12 wks 1953	% chge
Waterworks .	$4.0	$44.6	$57.3	—22
Sewerage ...	8.3	71.5	83.2	—14
Bridges	5.3	99.4	148.5	—33
Highways ..	20.9	263.5	276.0	—5
Earthwork, waterways .	7.1	66.9	90.0	—26
Buildings:				
Public, excl. hsg.	58.7	385.8	379.4	+2
Housg., pub.	0.3	40.2	170.5	—76
Housg., priv.	110.7	724.5	975.9	—26
Commercial	26.1	247.7	195.2	+27
Industrial .	24.4	335.3	959.9	—65
Unclassified.	17.8	206.2	363.6	—43
Total	**$283.6**	**$2,485.6**	**$3,699.5**	**—33**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

(millions of dollars)	Week of Mar. 18 1954	Cumulative 11 Wks 1954	% chge 1953-54
Corporate securities	$36.6	$668.2	—4
State and municipal:			
Excluding housing	100.1	784.2	+13
Housing	9.7	31.6	—77
Federal loans	1.1	22.1	—14
Federal aid	...	...	...
Total non-federal..	**$147.5**	**$1,506.1**	**—3**
In U. S.........	...	...	...
Outside U. S....	...	...	...
Total new capital..	**$147.5**	**$1,506.1**	**—3**

ENR indexes

		Base years = 100 1913	1926	1949
Constr. cost	**Mar '54**	**613.99**	**295.14**	**128.71**
	Feb '54	614.71	295.49	128.86
Bldg. cost	**Mar '54**	**437.17**	**236.32**	**124.27**
	Feb '54	437.55	236.53	124.38
Volume	**Feb '54**	**345**	**140**	**100**
	Jan '54	338	137	98

OFFICIAL PROPOSALS

Bids: April 15, 1954

Structural and Grading Work

GRADE CROSSING ELIMINATIONS
THROUGH DUNELLEN AND PLAINFIELD, NEW JERSEY
THE CENTRAL RAIROAD COMPANY OF
NEW JERSEY UNDER ORDER OF THE
PUBLIC UTILITY COMMISSION,
STATE OF NEW JERSEY

Sealed proposals will be received by The Central Railroad Company of New Jersey, at the office of the Chief Engineer, located at Jersey City Terminal, Room No. 44, Foot of Johnston Avenue, Jersey City, N. J., until 1:00 P.M. Thursday, April 15th, 1954, and publicly read at that time, for two contracts.

CONTRACT "A"—FOR STRUCTURAL WORK:

Construction of gravity and reinforced concrete box abutments and wingwalls for four (4) railroad bridges each supporting four (4) tracks as follows:

1—Over Rock Avenue, City of Plainfield, Union County, N. J.
2—Over Washington, Prospect and Madison Avenues, in the Borough of Dunellen, Middlesex County, N. J.
3—Related items of work consisting of coal trestle, pedestrian subway, box culvert, street grade changes, excavation, paving, concrete retaining walls, curbs, sidewalks, sewer and drainage lines, electric lighting, etc.

Structural steel for bridges to be furnished and erected by others; structural steel for the coal trestle to be furnished by the Railroad Company but to be altered and erected by the contractor.

Principal Quantities Involved:

Class "B" Concrete	6,000 cu. yds.
Class "C" Concrete	2,500 cu. yds.
Concrete Paving Base Class "D"	2,400 sq. yds.
Concrete Pavement	8,700 sq. yds.
Foundation Excavation	5,300 cu. yds.
Roadway Excavation	18,700 cu. yds.
Bituminous Paving	380 tons
Reinforcing Steel	603,200 lbs.
Concrete Piles (cast in place)	20,000 lin. ft.

The above work to be progressed in three stages, as follows:

First—Begin May 10, 1954 and complete November 1, 1954.
Second—Begin November 22, 1954 and complete May 15, 1955.
Third—Begin June 1, 1955 and complete September 1, 1955.

CONTRACT "B"—FOR GRADING:

Grading will include the construction of an earth embankment to carry four (4) elevated main line tracks with sidings for a distance of approximately 2.5 miles, beginning at Clinton Avenue, City of Plainfield, Union County, through the Borough of Dunellen, to Mountain Avenue, Middlesex, County, N. J.

Principal Quantities Involved:

Borrow Excavation—334,000 cu. yds. (in the completed embankment).
Run of Bank Gravel—51, cu. yds. (in the completed embankment).

The grading must be progressed in three stages, as follows:

First—Borrow Excavation—229,000 cu. yds. Run of Bank Gravel—35,000 cu. yds. Begin May 10, 1954 and complete October 15, 1954.
Second—Borrow Excavation—90,000 cu. yds. Run of Bank Gravel—14,000 cu. yds. Begin November 22, 1954 and complete May 1, 1955.
Third—Borrow Excavation—15,000 cu. yds. Run of Bank Gravel—2,000 cu. yds. Begin June 15, 1955 and complete September 15, 1955.

Proposal forms, drawings, specifications, bond and insurance requirements for both CONTRACT "A" STRUCTURAL WORK and CONTRACT "B" GRADING may be obtained at the office of the Chief Engineer of the Railroad Company, at the above address, on or after March 29, 1954. Contractors may bid on Contract "A" Structural Work or Contract "B" Grading, or both. Drawings and specifications for each contract may be obtained upon application at the office of the Chief Engineer on a deposit of $25.00 per set. A refund in full will be made to bidders upon return of each set in good condition within 30 days of award or rejection of bids.

The work will be awarded as separate contracts for Contract "A" Structural Work and for Contract "B" Grading. The successful bidders for each contract will be required to perform with his own organization not less than 80% of the total value of the contract, except for materials or items of work which require specialized knowledge, craftsmanship or equipment not ordinarily available in the contractor's organization.

OFFICIAL PROPOSALS

Bids must be made upon the standard proposal forms furnished for this purpose by the Railroad Company and must be enclosed in sealed addressed envelopes bearing, on the outside, the name and address of the bidder and the contract work bid upon, and must be accompanied by a certified check drawn to the order of the Treasurer of The Central Railroad Company of New Jersey, in the amount of $20,000. Bids and checks not enclosed in sealed addressed envelopes will be considered informal and will not be opened.

The Railroad Company reserves the right to repect any or all proposals.

S. L. Mapes, Chief Engineer
THE CENTRAL RAILROAD COMPANY
OF NEW JERSEY
JERSEY CITY TERMINAL, JERSEY
CITY 2, N. J.

SEARCHLIGHT SECTION

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OFFICIAL PROPOSALS

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CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO:
Official Proposal Division,
Engineering News-Record
330 West 42nd Street
New York 36, N. Y.

Bids: April 1, 1954

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time on the 1st day of April 1954, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1	G. L. Nickerson, District Engineer, 353 Broadway, Albany, N. Y.					
DISTRICT No. 2	L. Ketchum, District Engineer, 109 No. Genesee Street, Utica, N. Y.					
DISTRICT No. 3	William Robinson, District Engineer, 301 E. Water Street, Syracuse, New York					
DISTRICT No. 4	E. G. H. Youngmann, District Engineer, Barge Canal Terminal, Rochester, N. Y.					
DISTRICT No. 5	C. R. Waters, District Engineer, 65 Court Street, Buffalo, N. Y.					
DISTRICT No. 8	J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.					
Note: Plans and proposals for this contract may be obtained at our Albany and New York City offices only.						
DISTRICT No. 1	G. L. Nickerson, District Engineer, 353 Broadway, Albany, N. Y.					
Rensselaer	FARC 54-7	Eagle Mills-Clums Corners, SH 631; Brick Church-Rock Hollow, SH 197 Proj. F-592(4)	3.92	Asphalt Concrete, Opt.	$9,000 Plans $10	$171,000
Washington	FARC 54-10	Granville-Troy Stage, SH 104 Granville Village, SH 5404 Pro.j F-523(7)	2.22	Asphalt Concrete, Opt.	$5,000 Plans $10	95,000
DISTRICT No. 2	L. Ketchum, District Engineer, 109 No. Genesee Street, Utica, N. Y.					
Herkimer	FARC 54-35	Little Falls-Dolgeville, SH 133 Manheim Center-Salisbury Center, SH 463 Proj. F-584(2)	7.57	Asphalt Concrete, Opt.	$27,000 Plans $10	495,000
Oneida	FASH 54-2 FARC 54-42	Clinton Forks-Middle Settlement Utica-Oneida Castle Pt. 1, SH 250 Deansboro-New Hartford, SH 761 Proj. S-854(3)	1.79	9″ Cem. Conc. Pavt. 24′ Wide	$19,000 Plans $15	324,000
DISTRICT No. 3	William Robinson, District Engineer, 301 E. Water Street, Syracuse, New York					
Cayuga and Seneca	FARC 54-18	Auburn-Seneca Falls Pts. 2 & 1, SH 5042-590 Proj. F-331(6)	8.29	Ashpalt Concrete, Opt.	$54,000 Plans $15	982,000
DISTRICT No. 4	E. G. H. Youngmann, District Engineer, Barge Canal Terminal, Rochester, N. Y.					
Livingston and Wyoming	FARC 54-44	Pavilion-Greigsville Pts. 2 & 3, SH 1777 Greigsville-Piffard, SH 1777-A Geneseo-Piffard, SH 718 Proj. S-217(2)	7.68	Asphalt Concrete, Opt.	$29,000 Plans $15	575,000
Monroe	FASH 54-1 FARC 54-39	Rochester-Bushnell Basin, Pt. 1 SH 8223, SH 766 & SH 60 Interchanges; Pittsford-Palmyra Pt. 1, SH 766; Despatch-Pittsford Pt. 2, SH 481; Fairport (Brighton-Fairport Pt. 2), SH 60 Proj. U-UG 1107(1)	10.38	9″ Cem. Conc. Pavt. 2 @ 25′ Wide=7.74 Mi. Asp. Conc. Opt.=1.07 Mi. Dual Type Pavt. (Cem. & Asp. Conc.)=0.55 Mi. Grading & Drainage=0.89 Mi. Misc. Work=0.13 Mi. 7 Hy. Seps. Comp. I-Beams 180.1′, 155.6′, 243.3′, 127.4′, 200.9′, 218.3′, 179.3′ 1 RR Sep. Plate Girder 185.5′ 1 Br. Built-up Stringer 388′ 1 Br. Twin Conc. Box 22.5′ Each	$400,000 Plans $100	7,221,000
Wyoming	FARC 54-37	Wales Center-Varysburg Pt. 2, SH 8092 Proj. F-28(3)	6.33	Asp. Conc. Opt.=6.32 Miles Misc. Work=0.01 Mile	$25,000 Plans $15	460,000
DISTRICT No. 5	C. R. Waters, District Engineer, 65 Court Street, Buffalo, N. Y.					
Niagara	FARC 54-12	Hartland-Medina Pt. 1, SH 5431 Proj. F-181(2)	3.67	Asph. Conc. Opt.=3.59 Miles Misc. Work=0.08 M	$8,000 Plans $10	146,000
DISTRICT No. 6	J. H. Thomas, District Engineer, 30 West Main Street, Hornell, N. Y.					
Allegany	FARC 54-19	Belmont-Scio, SH 5476 Wellsville-Scio, SH 5129 Proj. F-332(6)	3.51	Asphalt Concrete, Opt.	$17,000 Plans $10	285,000
Schuyler	FARC 54-24	Bennettsburg-Perry City, Pt. 2, SH 1747 Proj. S-282(2)	4.31	Asphalt Concrete, Opt.	$15,000 Plans $10	272,000
Tioga	FARC 54-13	Owego-Campville Pt. 3, SH 1870 Proj. F-530(6)	4.24	Asphalt Concrete, Opt.	$21,000 Plans $10	369,000
DISTRICT No. 7	R. W. Sweet, District Engineer, 444 Van Duzee St., Watertown, N. Y.					
Clinton	FARC 54-23	Chateaugay-Lyon Mountain, Pt. 2, SH 8355 Proj. F-493(3)	7.69	Asphalt Concrete, Opt.	$22,000 Plans $10	388,000
Jefferson	FARC 54-14	Watertown-Sacketts Harbor-Henderson Pts. 2 & 1, SH 235-181 Sacketts Harbor, SH 1131 Proj. F-577(5)	7.70	Asphalt Concrete, Opt.	$13,500 Plans $10	243,000
DISTRICT 8	J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.					
Columbia	FARC 54-2	Craryville-State Line, SH 762 Proj. F-564(6)	2.75	Asphalt Concrete, Opt.	$9,500 Plans $10	169,000
Rockland	FARC 54-41	Spring Valley-Knapps Corners, SH 689 Knapps Corners-Nyack, SH 5178 Project U-1096(1)	2.56	9″ Cem. Conc. Pavt. 2 @ 24′ Var. Wide Hy. Sep. Conc. Rigid Frame 106′ Hy. Sep. Comp. I-Beam 118.2′	$110,000 Plans $15	2,040,000
Ulster	FARC 54-3	New Paltz-Plattekill, SH 572 New Paltz-Rifton, SH 308 Proj. F-613(10)	1.49	Asphalt Concrete, Opt.	$7,000 Plans $10	118,000
DISTRICT No. 9	F. W. Donovan, District Engineer, 71 Frederick St., Binghamton, N. Y.					
Broome	FARC 54-4	Bettsburg-McClure Pt. 2, SH 8285 Proj. F-360(9)	5.93	Asphalt Concrete, Opt.	$20,000 Plans $10	355,000
Otsego	FARC 54-5	Unadilla-Wells Bridge, SH 5229 Wells Bridge-Otego, SH 5153 Project F-628(5)	3.69	Asphalt Concrete, Opt.	$12,000 Plans $10	206,000
DISTRICT No. 10	M. E. Goul, District Engineer, Montauk Highway at Little East Neck Rd., Babylon, L. I., New York					
Nassau	FARC 54-15	Jericho Turnpike, SH 9020 Proj. F-1000(4)	1.86	Asph. Conc. Opt.=1.69 Mi. Shoulder Stabilization=0.15 Mi. Misc. Work=0.02 Mi.	$12,000 Plans $10	210,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: April 20, 1954

Construction of Substructure

NEW YORK STATE BRIDGE AUTHORITY
Advertisement for Proposals
for the
Construction of the Substructure
of the
Kingston Rhinecliff Bridge
Across the Hudson River.

The New York State Bridge Authority will receive sealed proposals for the construction of Contract No. 1, Substructure, of the Kingston Rhinecliff Bridge over the Hudson River until 2:00 P.M. Eastern Standard Time, on the 20th day of April, 1954, at the Authority's office, 22 Ferry Street, Kingston, New York, at which time and place proposals will be publicly opened and read aloud.

The work includes the construction of two abutments and twenty-two piers on land and eight piers in the river. The principal items of work include:

	Approximate Quantities
Bridge Excavation, Dry	12,000 cu. yds.
Bridge Excavation, Wet	12,000 cu. yds.
Concrete, Land Piers & Abutments	14,000 cu. yds.
Concrete, River Piers	47,000 cu. yds.
Granite Masonry	1,400 cu. yds.
Bar Reinforcement	2,700,000 lbs.
Structural Steel	500,000 lbs.
14" BP 89# Steel Bearing Piles	100,000 linear feet
Cast-in-Place Concrete Piles	9,000 linear feet

Plans, Specifications and Proposal Form for the work are on file in the office of the New York State Bridge Authority and in the Branch Office of D. B. Steinman, Consulting Engineer, 96 Liberty Street, New York, N. Y. and may be inspected by prospective bidders during office hours.

Plans, Specifications and Proposal Forms may be obtained from D. B. Steinman, Consulting Engineer, 96 Liberty Street, New York, N. Y., upon application and payment of a fee of fifty ($50.00) dollars, no part of which will be refunded.

Bids must be made upon the proposal forms included in the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of the New York State Bridge Authority for the sum of three hundred thousand ($300,000) dollars.

The right is reserved to reject any or all bids.

NEW YORK STATE BRIDGE AUTHORITY
James F. Loughran, Chairman
March 10, 1954

Bids: April 6, 1954

Route 4 Parkway, Sections 2, 5 & 8

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

Route 4 Parkway, Sections 2, 5 & 8, Comfort Stations at Glenside, Madison Hill and Tall Oaks Picnic Sites, Woodbridge Township, Middlesex County; Clark & Cranford Townships, Union County. The principal items of work are:

Three (3) Masonry Comfort Stations & Appurtenances

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, April 6, 1954, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: April 13, 1954

Construction of School

Sealed proposals for the construction of the Pascack Valley Regional High School, Hillsdale, Bergen County, New Jersey, will be received by the Pascack Valley Regional Board of Education at the office of the Secretary, Mary Morrison Bohan, mailing address 61 Euclid Avenue, Westwood, New Jersey, or by delivery to the Social Room of George White School, Magnolia Avenue, Hillsdale, New Jersey, until 2:00 P.M. E.S.T. on April 13, 1954, at which time and place the proposals will be publicly opened and read.

Separate proposals will be received for the following work:

Contract #1—General Construction
Contract #2—Steel, Iron and Aluminum Work
Contract #3—Plumbing
Contract #4—Heating and Ventilating
Contract #5—Electrical Work
Contract #6—Site Improvement

Forms of proposal, drawings, specifications and other contract documents may be obtained from the office of Starrett and Van Vleck, Architects, 267 Fifth Avenue, New York, New York.

By order of the Pascack Valley Regional Board of Education, Mary Morrison Bohan, Secretary.

Bids: April 6, 1954

Route 26, Section 6A

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

Route 26, Section 6A, from Howes Lane to Cranbury Cross Road, Drainage Improvement, North Brunswick Township, Middlesex County. Length of Project 0.375 miles. The principal items of work are:

Estimated:

1,500 cu. yds.	Roadway Excavation—Earth
3,655 sq. yds.	Macadam Base Course, 6" thick
3,655 sq. yds.	Pavement, Type MA-BC-1, 2" thick
1,354 lin. ft.	Reinforced Concrete Culvert Pipe
2,800 lin. ft.	9" x 20" Concrete Curb

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, April 6, 1954, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.000 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: April 6, 1954

Route 42, Sections 10A & 11A

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

Route 42, Sections 10A & 11A, North-South Freeway, between Washington Street and Jefferson Street, Partial Demolition of Buildings, City of Camden, Camden County. Length 1.403 miles. The principal items of work are:

Estimated:

Demolition of Buildings

36	Brick Buildings
27	Frame Buildings
11	Block & Brick Garages
5	Frame Sheds & Garages
2	Brick Warehouses

Other Items

10,000 cu. yds.	Borrow Excavation
4,800 sq. ft.	Masonry Walk
9,200 sq. ft.	Cement Plaster Surface
7,400 sq. ft.	Sheathing

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, April 6, 1954, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in seal special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

OFFICIAL PROPOSALS

Bids: April 8, 1954

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 8th day of April 1954, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1 G. L. NICKERSON, District Engineer, 353 Broadway, Albany, N. Y.				
Warren	FARC 54-47	The Glen-Wevertown, SH 1963 Project F-757(2)	5.65	Asp. Conc. Opt.	$13,000 Plans $10	$222,000
		DISTRICT No. 2 L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica, N. Y.				
Madison	FARC 54-46	Furmans Mills-Hubbardsville, SH 8297 Hubbardsville-North Brookfield, SH 8203 Project F-456(6), F-277(2)	3.66	Asp. Conc. Opt.	$14,000 Plans $10	245,000
Oneida	FARC 54-16	Kirkland-Rome, SH 8246 Project F-415(9)	2.85	Asp. Conc. Opt.	$13,000 Plans $10	232,000
		DISTRICT No. 6 J. H. THOMAS, District Engineer, 30 West Main Street, Hornell, N. Y.				
Chemung	FARC 54-20	Alpine-Cayuta Pt. 2, Cayuta-Swartwood, Pts. 1 and 2, SH 8242 Erin-Van Etten-Spencer Pt. 1, SH 1311 Project F-400(4)	1.21	Asp. Conc. Opt.	$7,000 Plans $10	125,000
Steuben	FARC 54-22	Cohocton-Wayland Pt. 1, SH 1104 Project F-134(3)	2.87	Asp. Conc. Opt.	$13,000 Plans $10	221,000
		DISTRICT No. 7 R. W. SWEET, District Engineer, 444 Van Duzee St., Watertown, N. Y.				
St. Lawrence	FARC 54-2	Madrid-Potsdam, SH 9026 Project S-434(1)	5.11	Asp. Conc. Opt.	$10,500 Plans $10	188,000
St. Lawrence	FARC 54-34	Harrisville-Fine Pts. 1&3, SH 8337 Proj. F-382(6)	6.48	Asp. Conc. Opt	$19,000 Plans-$10	349,000
		DISTRICT No. 8 J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.				
Dutchess	FARC 54-36	Red Hook-Rhinebeck SH 5092 Project F-322(11)	2.85	Asp. Conc. Opt.	$12,000 Plans $10	201,000
Dutchess and Putnam	FARC 54-45	Terrys Corners-Ludingtonville-Dutchess Co. Line, SH 8347 Putnam County Line-Stormville Pt. 1, SH 8366 Project F-501(6), F-468(11)	2.92	Asp. Conc. Opt.	9,000 Plans $10	158,000
		DISTRICT No. 9 F. W. DONOVAN, District Engineer, 71 Frederick St., Binghamton, N. Y.				
Broome	FARC 54-25	Chenango Bridge-Kattelville, SH 1487 Project F-379(8)	1.09	Asp. Conc. Opt.	$10,000 Plans $10	177,000
Broome	FARC 54-26	Castle Creek-Whitney Point, SH 1450 Project F-717(3)	0.95	Asp. Conc. Opt.	$9,000 Plans $10	167,000
Chenango	FARC 54-27	Smyrna Village, SH 809; Otselic-Smyrna Pts. 2A & 1, SH 599-1473; Smyrna-Sherburne, Pt. 2, SH 9097; Otselic-South Otselic Pt. 1, SH 664 Project F-782(2), S-838(3), (4)	8.11	Bit. Mac. Type 1 (Pen. Meth.)	$30,000 Plans $15	545,000
Schoharie	FARC 54-28	Cobleskill-West Richmondville, SH 5458 Project F-471(9)	3.98	Asp. Conc. Opt.	$14,000 Plans $10	239,000
		DISTRICT No. 10 M. E. GOUL, District Engineer, Montauk Highway, Babylon, L. I., New York				
Suffolk	FARC 54-48	Cold Spring-Huntington-Fort Salonga Pt. 1, SH 1525 Main Street, Huntington, SH 9330 Project F-566(6)	0.57	Asp. Conc. Opt.	$9,000 Plans $10	157,000
Suffolk	FARC 54-38	Port Jefferson-Riverhead Pts. 1 & 2A, SH 8094-5674 Project S-430(1)	6.08	Asp. Conc. Opt.	$35,000 Plans $10	613,000
Suffolk	B.P. 54-52A	Shinnecock Inlet (West Jetty Extension)	....	Stone Jetty Extension and Erection of Light Tower	5% of Bids Plans $10	163,625
Albany, Greene, Schen., Herkimer, Madison, Mont., Oneida, Cayuga, Onon., Seneca, Gen., Monroe, Ont., Erie, Orange, Rock., Ulster	T. T. S. 54-1	New York State Thruway—Catskill, Mohawk, Ontario and Hudson Sections	....	Furnishing & Erecting Interchange Traffic Signs	$10,000 Plans $10	$200,000

Note: Plans and proposals for this contract may be obtained at our Albany and New York City offices only

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City."

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

INSURE COMPETITION

and get the lowest possible bid for your proposed work by placing your bids wanted advertising in this Section.

Don't limit competition to local bidding alone. Bring it to the attention of contractors the country over. They read this Section every week—make sure your bid is here where they can read it.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT:
BUSINESS:

"OPPORTUNITIES"

:EQUIPMENT
:USED OR RESALE

UNDISPLAYED RATE

~~$1.80~~ a Line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Discount of 10% is allowed if full payment is made in advance for 4 consecutive insertions.

POSITION WANTED undisplayed rate is one-half of above rate, payable in advance.

Box Numbers in care of our New York, Chicago and San Francisco Offices count as one additional line.

Replies are forwarded each day as received at each of the offices mentioned without additional charge.

EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED RATE

The advertising rate $20.50 per inch for all advertising appearing on other than a contract basis. Contract rate quoted on request.

An advertising inch is measured ⅞ inch vertically on one col. 3 col.—30 inches to a page. E.N.R.

SEND NEW ADVERTISEMENTS to N. Y. office, 330 W. 42nd St., N. Y. 36, for April 8th issue, closing March 29th.

HIGHWAY DESIGN ENGINEER

Degree. Minimum 5 years responsible work on overall design and planning of highways.

MUNICIPAL ENGINEER

Degree. Minimum 5 years responsible work on overall design and planning of city streets.

SPECIFICATION WRITER

Degree. Responsible experience in writing specifications for heavy civil engineering work. Must have ability to correlate specifications for incidental architectural, mechanical and electrical phases of work into completed specifications.

ARCHITECTURAL DRAFTSMAN

Minimum 5 years experience. Preferably in industrial plant design.

Submit complete resume. Salary requirements, references and date of availability with first letter.

P-2176, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

(Additional Positions Vacant Advertisements on the opposite page)

WANTED — FORM Designer — Write Fully. P-2055, Engineering News-Record.

ALUMINUM REDUCTION plant General Contractor now in process of expanding field supervisory force. Considering applications for area superintendents, assistant area superintendents, and mechanical superintendents. Submit complete details including age, education, experience, references, availability, and salary expected P-2052, Engineering News-Record.

PARTY CHIEF or Transitman—Municipal survey experience required, boundary surveys, subdivision, roads and sewers. Send personal experience summary. Location northern N. J. P-1932, Engineering News-Record.

ARCHITECTURAL DRAFTSMAN wanted with 4 years minimum experience in drafting plans for school and church work. Good pay and permanent position for man who can assume responsibility. Write P. O., Box 73, Lancaster, Ohio giving qualifications and experience or telephone Lancaster 2243.

GENERAL CONSTRUCTION firm wants estimator capable of handling complete bids. Salary open. Ajax Construction Co., 925 15th St., Washington, D. C.

GRAVEL PLANT Superintendent for portable and stationary plant in Michigan and Indiana. State exact experience and wages. P-1810, Engineering News-Record.

SALES ENGINEER—We need experienced concrete or concrete construction engineer. Must have sales ability and potential to organize and head branch office. Salary, expenses and commission. Various locations. Considerable travelling. Interesting, long term, independent position. Sika Chemical Corporation, Passaic, New Jersey.

HIGH GRADE Experienced highway and/or Bridge Engineer wanted by long established prominent Eastern Firm. Include experience and Salary requirements in first letter. P-2154, Engineering News-Record.

SURVEY PARTY CHIEF

For structure layout, topography and quantity surveys on heavy construction projects for owner in upstate New York. Reply stating qualifications, experience and personal data.

P-2166, Engineering News-Record
330 W. 42 St., New York 36, N .Y.

BRIDGE ENGINEERS

experienced in design of highway bridges. Excellent opportunity for responsible men. Please write giving complete qualifications.

Berger Associates
404 South Clinton Street
Syracuse 2, New York

CONCRETE TECHNICIAN

For design and control of concrete mixes including field test work for owner on heavy construction projects in upstate New York. Desire man with technical training and experience in concrete construction. Reply stating qualifications, experience and personal data.

P-2163, Engineering News-Record
330 W. 42 St., New York 36, N .Y.

POSITIONS VACANT

BRIDGE—HIGHWAY Engineers—Designers—Draftsmen. For work on bridges, expressways and turnpikes. Location Midwest. Permanent positions with periodic promotions depending on experience and ability. Paid vacations, sick leave, hospitalization and life insurance. Include education, experience, reference and salary expected in application letter. P-2109, Engineering News-Record.

GENERAL SUPERINTENDENT or Project Manager. A minimum of 15 to 20 years experience in the operation and maintenance of heavy cranes and draglines required. Knowledge of all other heavy construction equipment desirable. Experience should also include responsibility for costs and the ability to deal and associate with industrial executives. Work involves the directing of operations on the site of a steel mill located near Calcutta, India. Address all replies to Box P-2187, Engineering News-Record giving complete personal information: All details of work experience; at least 5 references as to character and ability and the terms of employment and salary arrangements required. P-2187, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

SALES ENGINEER—Pittsburgh, Pennsylvania and Albany, New York territories open with established national concern selling prefabricated metal products to engineering and construction markets. Positions offered are permanent and present excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Ag 24 to 30. Car furnishd. Complete training program. Salary and bonus. RW-1420, Engineering News-Record.

EMPLOYMENT SERVICES

OVERSEAS PROJECTS Guide to most active constructors-engineers, oil co's., gov't. & UN groups hiring for foreign projects. Send $1. Cove-McKane Int., GPO Box 126E, NY 1, NY.

POSITIONS WANTED

PROJECT MANAGER, construction superintendent or engineer (graduate), 28 years experience heavy construction, industrial buildings, machinery. PW-1790, Engineering News-Record.

POSITIONS WANTED

BUILDING ESTIMATOR, 20 years experience all type structures, pricing, sub-bids expediting etc.—Graduate registered engineer. PW-1910, Engineering News-Record.

GENERAL SUPERINTENDENT, project manager offers 25 years broad experience in heavy construction. Interested in Thermal or Hydroelectric. Available immediately. PW-2033, Engineering News-Record.

GRADUATE CIVIL Engineer — Reg. Ohio — 18 years bridge & building design, detailing & estimating experience with fabricators, consultants, contractors & government. Desire opportunity to advance with company. Prefer North Central States. PW-1964, Engineering News-Record.

PIPING SUPT. 30 years practical construction experience installing Oil Rfys-Chemical-Power pts-Mining Smelters etc. Wants connection with company on foreign wk. Speak fluent Spanish—handle and train native labor. PW-2083, Engineering News-Record.

ELECTRICAL SUPERINTENDENT being retired by major construction company after 30 years service. In good health and capable of supervision or work in advisory capacity in any phase of electrical industry. Complete history available upon request. Available July 1st, 1954. PW-2046, Engineering News-Record.

ENGINEER Reg. P.E. Reports, investigations. Settlement of contractors' claims, 45 years experience; design, construction. Turnpikes, tunnels, buildings, foundations, schools, etc. PW-2073, Engineering News-Record.

PROFESSOR—SPECIALIST in Structures and Mechanics of solids desires teaching position in south or southwest. Now full professor in large University but personal considerations make change to above location desirable. Doctor and Masters degrees with 16 years teaching and 10 in design. PW-2074, Engineering News-Record.

CIVIL ENGINEER — B.S.C.E. Age 26. County Engineer in charge of all civil works in large midwestern community last 18 mos. Desires position of responsibility and leadership with progressive organization. Will travel or relocate. PW-1966, Engineering News-Record.

CIVIL ENGINEER: B.S.C.E., Reg. 31, single, 7 years experience; 3½ surveying and construction supervision, 3½ structural design. Desires position as engineer or superintendent for contractor on heavy construction in West. PW-1934, Engineering News-Record.

PROJECT MGR. Construction Supt. Engineering education. 50 yrs. age. Free to travel. 26 yrs. experience in industrial buildings and equipment installations. Know costs. 17 yrs. with one General Contractor. Resume upon request. PW-1929, Engineering News-Record.

MECHANICAL INSPECTOR completed overseas U. S. Government contract of heating and ventilating plumbing and sprinkler systems. Over twenty-six years experience erection repair and maintenance of heavy industrial, power plant, pumping stations and marine equipment. Available now. PW-1988, Engineering News-Record.

CIVIL ENGINEER, registered, estimator, with long design and contracting experience desires work with progressive contracting firm or architect as designer, estimator or assistant to Manager. Available soon. Write PW-1534, Engineering News-Record.

ENGINEERING EXECUTIVE Graduate with broad experience in administration, design, fabrication, and sales of mechanical and structural products desires position in sound progressive company, managing, promoting development and sales, providing talent and new spirit where interest lags. Now employed, but desires to exert energy to better advantage. PW-2126, Engineering News-Record.

MANAGER—READY Mix Concrete plant conc. spec. reg. eng'r. Sales ability top Ref. & Record. Salary & Comm. PW-2134, Engineering News-Record.

CIVIL ENGINEER — age 29 — experience in heavy construction—desires position with gen'l contractor in Philadelphia area. PW-2118, Engineering News-Record.

SALES ENGINEER—C.E. 34, 11 years experience reinforced and prestressed concrete design and promotion, desires position as construction sales engineer. Aggressive, accustomed responsibility. Will relocate. PW-2115, Engineering News-Record.

STRUCTURAL DRAFTSMAN, Detailer, experienced on office buildings, factories, desires permanent position. Prefer modern office. PW-2180, Engineering News-Record.

(Continued on the opposite page)

STRUCTURAL STEEL FABRICATOR

- **Can you use representation in Metropolitan New York by a man with a thorough knowledge and experience of the business. If desired estimating, detailing and erection can be arranged for.**

RA-2124, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS WANTED

(Continued from opposite page)

SUPERINTENDENT OF Construction or General Carpenter Foreman desires position. Years of varied experience. PW-2128, Engineering News-Record.

GENERAL SUPERINTENDENT: Services Available, background 25 yrs: Experienced all phases, medium or large scale projects: Includes diverse Bldgs. and Heavy Construction facilities, for Private, Commercial-Industrial, Defense, Public Works. Large Earth & Rock Exc's. Cofferdams, Land & Marine, Open-Foundations, Bridges & Viaducts, Hydro-Elec. Dams, R.R. & Highway Grade-Separations, Sub-Surface Utilities, Mass & Reinf. Concrete, Airports. Production-Cost-Wise, Mature Judgment, References, Let's talk it over. PW-2127, Engineering News-Record.

CHIEF ENGINEER or Asst. Supt.—Age 35, B.S.C.E., Licensed N. J., 12 yrs. Widely diversified experience, in heavy const. including large scale dredging and excavation, highway, bridge, warehouse, power house, and dock construction. Presently Ch. Engr. on const. of major refinery project. Well versed in Const. Office practices, progress reports, supervision. Desires permanent connection with well established heavy construction organization operating mainly in Central N. J. or vicinity. Available soon. PW-2145, Engineering News-Record.

MANAGER EXECUTIVE, 20 years experience in construction and building materials. Broad knowledge of foreign and domestic engineering and construction. Graduate Engineer. PW-2144, Engineering News-Record.

MECH. ENGR.—graduate, (31), 7 years diversified experience primarily mech. installation-piping. Desires job with firm doing similar work. Location optional. PW-2142, Engineering News-Record.

EXPERIENCED ARCHITECTS Superintendent, now employed, desires change. PW-2141, Engineering News-Record.

INDUSTRIAL STRUCTURES construction position sought by 1949 civil engineering graduate. Experience includes 2 years in construction supervising, expediting, and resident engineering; 2 years in public utility administration on methods, budgets, and costs; and 1 year in prestressed concrete design. PW-2143, Engineering News-Record.

CONSTRUCTION INSPECTOR—Thorough familiarity with engineering standards and specifications and inspection methods. Resume on request. Will relocate. PW-2172, Engineering News-Record.

PROFESSOR, STRUCTURAL, hydraulic, fluid mechanics; Ph.D. first class university, 4 honorary societies, full member ASCE, 25 years teaching and practicing experience; now teaching, desires relocation & some graduate courses. PW-2171, Engineering News-Record.

PROJECT MANAGER, available April 1st. Engr. background. Reg. C.E. Good organizer. Results guaranteed. Cost conscious. Bridges—Caissons — Cofferdams — Pile Driving — Flood control dams — Power plants — Sewerage disposal plants—Oil refineries—Industrial plants—Commercial bldg's. Resume—reference furnished upon request. PW-2110, Engineering News-Record.

JUNIOR DESIGNER BSCE, 3 yrs. experience. Desires position in Northeastern states. Present salary $5100. PW-2169, Engineering News-Record.

EXECUTIVE ENGINEER with broad experience in structural engineering, organizing and administrative work, needs to relocate. Has been engineering project manager on many jobs, responsible for client contacts, basic planning, estimates, schedules, designs and contracts. Experienced on power plants, industrial plants, dams, paper mills, laboratories, offices, etc. Has worked for consulting engineers and contracting organizations. Now Chief Engineer of steel-fabricator doing $12 million volume. Age 45. Wants responsibilities requiring analytical mind, broad experience, mature judgment and executive ability. PW-2184, Engineering News-Record.

CHIEF OF Party and Transitman experienced in highway construction and preliminary surveys prefer Northeastern States. PW-2186, Engineering News-Record.

STRUCTURAL DESIGNER, thoroughly experienced in design of Industrial and Commercial type buildings, now in supervisory position with large Southern California firm wants similar position in San Francisco area. PW-2185, Engineering News-Record.

SANITARY ENGINEER seeks position with private water co. 33, M.S. Experienced in treatment plant design, distribution systems, water quality and laboratory control. Prefer west coast. PW-2183, Engineering News-Record.

STRUCTURAL DESIGNER who wants to work for an architect in N. Y. met. area. 3½ yrs. varied experience. Write for resume. PW-2181, Engineering News-Record.

(Continued on the following page)

Estimators

Building Mechanical Electrical

Must have take-off and pricing experience on all types of industrial and commercial buildings and/or mechanical and electrical installations.

These openings in Cleveland Office offer excellent working conditions with paid vacations, sick leave, participating group insurance program and overtime on established 5 day 45 hour work week.

Replies will be treated confidential and arrangements will be made to interview selected applicants. Please submit complete resume stating experience, education, salary required and date available to:

The H. K. Ferguson Company
Engineers and Builders
Ferguson Building Cleveland 14, Ohio

CHIEF ENGINEER

WANTED

For nationally known hydro-electric consulting engineering firm. Position offers opportunity to grow with the organization and participation in profits. Applicant must have broad experience in this specific field, and ability to organize and direct design. If you are qualified send photograph and outline of education and experience, including employers' names, your titles and duties, and references; also statement of acceptable salary range and approximate availability. Confidence will not be violated.

P-2102, Engineering News-Record
520 N. Michigan Ave., Chicago, Ill.

CONCRETE INSPECTORS

Experienced inspectors desired for aggregate processing, mixing plant testing and control, and field placing inspection on large project located in the Northeast. Submit experience, record and references.

P-2147, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

FIELD ENGINEER

For supervision of commercial construction in Houston, Texas area. Experience in mechanical and electrical installation desirable. Good Opportunity.

$6,000-7,000

Send complete resume to:

P-2122, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

HEAVY EQUIPMENT SALESMAN

Experienced heavy construction equipment, tractor bulldozers, power shovels; young, aggressive. Must be 1st class man with good background; metropolitan N. Y. territory. Excellent opportunity. Generous drawing account against commission. Write full details in confidence. Our sales staff knows of this advertisement.

RW-2123, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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for general building contractor. Excellent opportunity and permanent position with young, expanding company. Must be capable of estimating and analyzing subbids received from mechanical and electrical subcontractors and supervise and expedite work after subcontract awarded. Write full particulars, including education, experience, personal details, and salary requirements to:

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Civil Graduates of accredited U. S. colleges. Must have not less than the following experience:

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Designers—5 years responsible work on structural steel and concrete including work on long span bridges.

Squad Leaders—3 years responsible charge of squad on structural steel detailing.

Specification Writers—With design and field experience for writing specifications for steel bridges, concrete structures, and highway construction.

Please mail complete resume
together with salary required to:

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POSITIONS WANTED

(Continued from preceding page)

CONSTRUCTION SUPERINTENDENT—Executive ability. Take full charge of project. 25 yrs experience. Industrial and other type buildings. Top man with good record. Past employers can be contacted. East preferred. PW-1992, Engineering News-Record.

GEN. SUPT. desires connection available April 1st. Engr. background reg. C.E. Good organizer. Results guaranteed. Bridges—Cofferdams—caissons—Piledriving—Flood control dams—Power plants—Sewerage disposal plants—Oil refineries — Industrial plants — Commercial bldg's.—Resume reference furnished upon request. PW-2113, Engineering News-Record.

SELLING OPPORTUNITIES WANTED

SALES ENG'R—Seeking challenging opportunity with M'g'r of product sold const'n Industry—Highest references. SA-2018, Engineering News-Record.

AS MAG'R or Asst. Mag'r. of Sales—A producer well acquainted — Archt's, Engr's, Genl., Contr's, Large Industrial firms N. Y. — Phila Areas—Presently employed — Excellent References. SA-2019, Engineering News-Record.

GOVERNMENT SALE

Sealed proposals for the purchase of 25 cycle electrical motor starters, solenoid and thruster brakes offered for sale by Panama Canal Company will be received by Procurement Officer, 24 State Street, New York 4, N. Y., until 10:30 A.M. April 5, 1954 and at that time publicly opened. Bid forms available at this office upon request. (Invitation No. 61).

BUSINESS OPPORTUNITY

Architectural Engineer seeks partner to establish general construction business or consider partnership in existing concern. BO-2182. Engineering News-Record.

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FS-2160, Engineering News-Record
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FS-2120, Engineering News-Record
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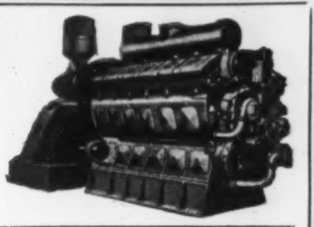

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700	Worthington	EE-8	1000	327	200	General Motors	8-268A	350	900
500	General Motors	8-278A	750	720	150	Worthington	CC-4	225	450
500	General Motors	8-567	720	720	150	Ingersoll-Rand	S-4	225	600
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1—Unit ½ Yd. Backhoe Late 1952		9,000
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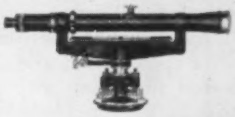

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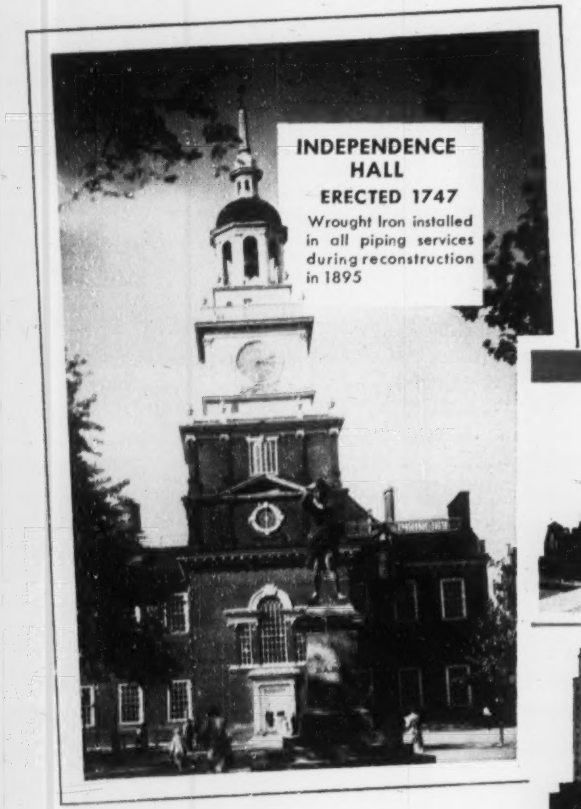
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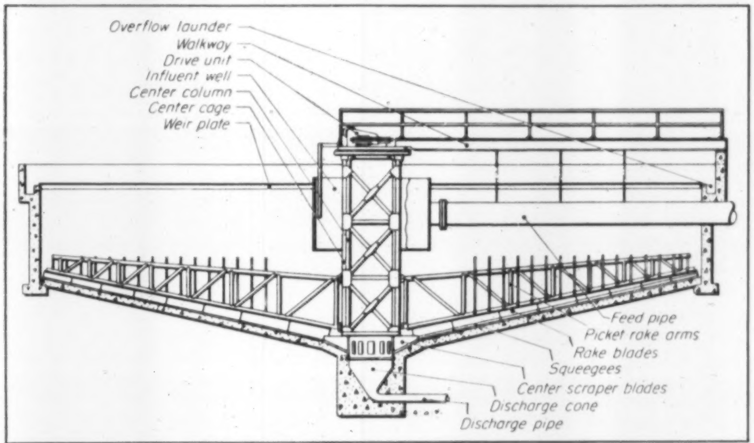


New process halves sludge volume

Dorr unwraps its Densludge process, said to double digester capacity, kill odors

The Dorr Co. has just announced the development of the Dorrco Densludge Process for the continuous thickening of sewer sludge. Applicable to both primary and secondary sludge treatment, the process entails continuous withdrawal of the sludges involved and controlled thickening of the mixture.

Sludge volume is said to be decreased up to 50% as compared with that produced by the usual methods with a resulting decrease in required digester capacity. Equally important, digester supernatant liquor is eliminated.

The announcement signalizes the culmination of the development work initiated by Wilbur Torpey, sanitary engineer with New York City's Department of Public Works. The manufacturer and Torpey have long had their heads together over experimental sludge thickening at New York's Bowery Bay plant (ENR Oct. 22, 1953, p. 23 and Feb. 18, p. 140).

Use of the new process places sludge removal from the clarifiers on a continuous basis and separates the functions of sewage clarification and sludge concentration. Continuous removal of dilute underflow permits clarification unaffected by the byproducts of sludge thickening. By the concentration of dilute primary or mixed sludges in the Door Densludge Thickener without undue concern for thickener effluent quality, a sludge is produced with about half the volume of conventional clarifier underflows. This decrease in volume increases not only digester capacities but other sludge handling facilities as well.

When the Densludge process is applied to the activated sludge process, part of the mixed liquor is normally combined with primary sludge prior to thickening. When plant limitations preclude wasting this liquor some of the return sludge and final clarifier effluent may be substituted.

With the modified sludge aeration process, a portion of the return sludge is wasted to the thickener. In both high and low-rate trickling filter treatment, all of the secondary clarifier underflow is combined with primary sludge and thickened prior to digestion.

The manufacturer says that the addition of the Densludge Thickener will greatly increase—at relatively low cost—the capacity of sludge handling facilities in existing plants. Similarly, in new plants smaller facilities will be required.

The thickener, available in 10 to 100-ft dia, is reported to require little operating attention and produces further savings by reducing digester heat requirements through elimination of digester supernatant liquor. It is said, too, that the process eliminates secondary digester tanks and sludge may be stored in open tanks without fear of odor nuisance. The Dorr Co., Barry Pl., Stamford, Conn.

Crushing plant is highly portable

A new, single-unit crushing plant has been designed for rapid production of aggregates from local quarries.

The new plant, Model 33R, has a triple roll crusher that allows two almost simultaneous passes at the rock. This feature in turn permits placing all units on one chassis. Units of the plant are large enough for quarry work and include an 18x30-in. jaw crusher, an apron feeder mounted on the plant, a 1½-deck sizing and separating screen and a 30x18-in. triple roll secondary or reduction crusher.

Weight has been kept to about 71,000 lb without power unit. Overall length less towing hitch is 45 ft 10 in., moving height with apron feeder removed is 12 ft 6 in. and moving width is 9 ft 8 in.

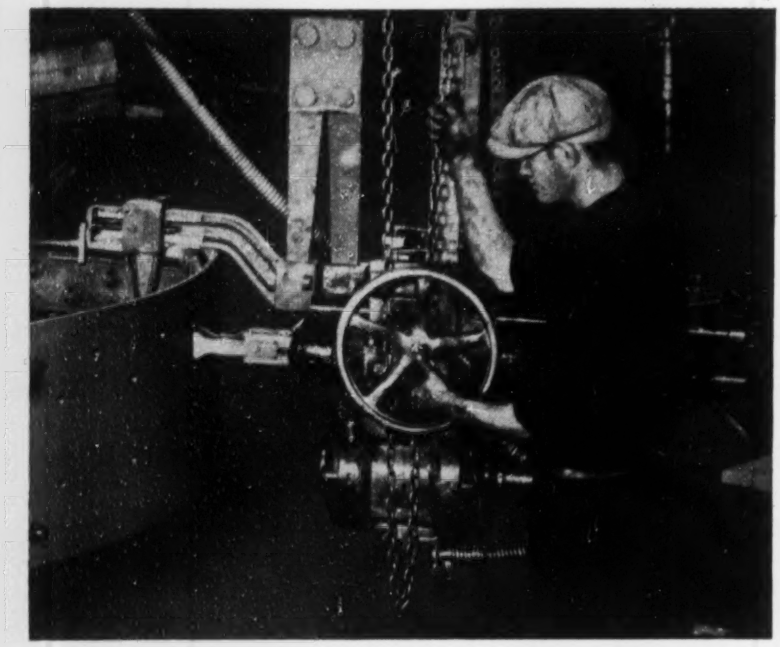
The plant is reported to be suited excellently for road building and other projects where larger units, a high degree of portability and easy plant set-up are required. Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis, Minn.

(*New Products continued on page 94*)

forming the wall, survey men checking pour height, laborers pouring and vibrating the mix, iron workers inserting dowels and anchor bolts and cement finishers troweling and topping. No noticeable dislocation was reported.

In another case where a contractor

(Continued on page 99)



Portable drill handles bulky jobs

A portable, push-button drilling machine now under production has been designed to operate from any position around steel beams, girders and weldments too bulky to be handled on conventional metalworking equipment.

Suspended from a crane or other overhead structure, the drill head is counterbalanced to allow the operator to shift the mechanism rapidly from one hole to the next—and from vertical to horizontal drilling and back to vertical. This swinging support and method of mounting also permit the drill to be centered directly over the punch mark for exact drilling of holes up to 2-in. in diameter.

One advantage claimed for the new drill is that it automatically penetrates steel at right angles to the work surface.

A special clamp—similar to the ordinary "C" clamp—holds the drill head securely to the work. Quick adjustment makes it adaptable to materials of varying thickness and assures drilling perpendicularly to either flat or curved surfaces. No leveling of the work piece is necessary.

Operation of the machine is said to be simple. The drill head is moved over the punch mark in the steel surface and the drill point located by means of a hand wheel. When the button is pressed for automatic controls to take over, the drill head clamps to the steel structure and drilling starts. After the hole is made, the drill withdraws automatically.

The drill head is a single, space-saving unit made up of a 5-hp motor, air cylinder, gearing, valve control and spindle. Artos Engineering Co., 2757 S 28th St., Milwaukee 46, Wis.

Low-cost wale support stops accidental form distortion

A simple but effective wale support may turn out to be the answer to many a carpenter foreman's prayers. The inexpensive form accessory fits neatly over any 2 x 4 upright and is held securely by two nails. In this position it serves as a shelf for horizontal wales and prevents downward thrust on tie rods.

The supports may be spaced as conditions dictate, and when spaced properly will support the weight of workmen on the wales, preventing distortion or injury to wedges, spreaders or tie rods.

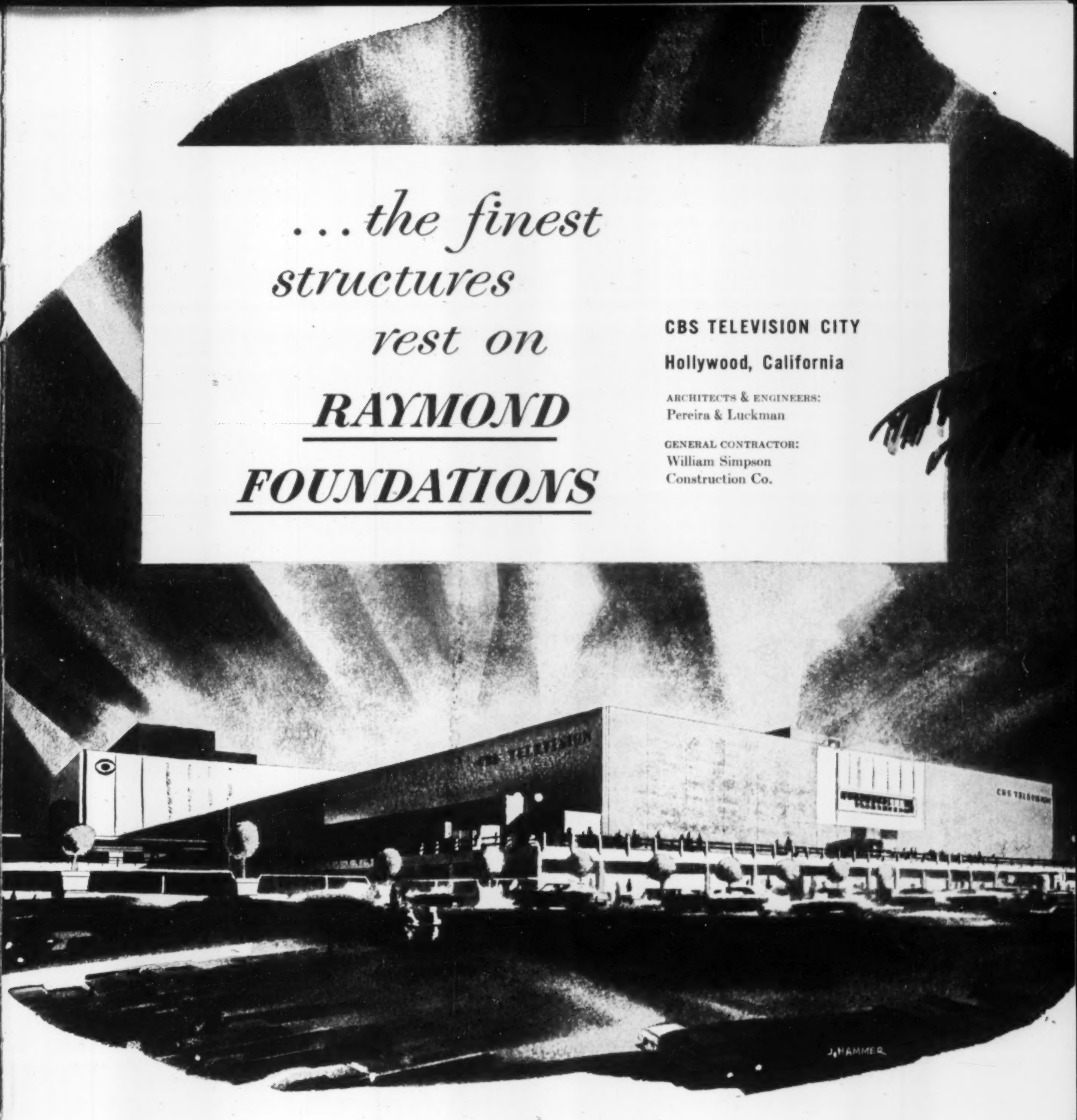
The supports are installed by locating them on the stud and fastening them with two nails driven through prepared holes. The wales are placed across the supports and tightened with the tie rods.

On a recent test installation in Boston the supports withstood, successively, the weight of carpenters

TWO NAILS hold support in place.

WALES are placed and drawn up.

FINISHED JOB supports workmen.



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HYDRAULIC TORQUE CONVERTER WITH UNIDRIVE TRANSMISSION — AN EXCLUSIVE FEATURE ON EIMCO TRACTOR EXCAVATORS

When hydraulic torque converters were first used in heavy prime moving equipment it marked a step forward in tractor design. But now the hydraulic torque converter with the Eimco Unidrive transmission provides the ultimate in heavy tractor drives and the ideal combination for effortless operation, longer life through cushioned load, increased work output and maximum operating efficiency.

The Eimco 105 is the only crawler tractor with the maneuverability permitted by hydraulic torque converter and Unidrive transmission.

This combination of mechanical ingenuity makes the 105, a 17 ton brute, as agile as a kitten. You can dance right, left, forward, backward without stopping to shift, without scraping a track pad.

The Eimco 105 matches all load conditions with exactly the right combination of speed and power and is capable of exerting maximum draw bar pull AT ALL TIMES.

It is the only crawler tractor in which the operator can change gears under full load, on grades or uneven terrain without stopping, losing position or dropping the moving load.

The 105 develops more drawbar pull per engine horsepower than any other tractor.

The 105 is the only tractor designed for the heavy attachments ordinarily used on tractors today. This extra strength built into the 105 is designed to

WITH COST SAVING ADVANTAGES

absorb the extra vertical loads into the main frame permitting all auxiliary equipment to be attached to the frame and leaving the tracks free to oscillate on uneven ground.

105s are made of heavy fabricated or cast alloy steel parts throughout. All gearing, bearings and shafts are oversize for years of uninterrupted service. All parts are easily accesible for quick service. Clutches never need adjustment. Timken tapered roller bearings are separately caged in track rollers, idlers and final drives for perfect alignment, accurate fit and long life.

The Unidrive transmission is a compact, complete unit, containing all the gearing and clutches for speed changing and full independent reversal of each track. This design combines all of the best features of constant mesh gearing and hydraulically operated friction clutches with sealed oil bath pressure lubrication of all wearing parts.

The independent control of each track, made possible by the Eimco Unidrive transmission, is another exclusive feature. Two separate final drives, one for each track, have extra heavy alloy steel gearing and extra large diameter shafts. There are no clutches, brakes or gadgets in the Eimco 105 final drives.

The operator of the Eimco 105 sits up front where he can see his work. The controls are easy and convenient. Tractor controls require only one hand with the other free to operate the attachment. Foot pedals have been eliminated for clutching, shifting or turning. Stopping to shift for speed changes or reverse is eliminated.

The Eimco 105 gives you new, low operating and maintenance costs. You get the work capacity of the largest crawler tractor units but with the low initial investment as well as the operating economies previously confined to the smaller tractors.

Eimco 105s offer more exclusive advantages and have improved design and construction features in EVERY part. This is the reason Eimco 105s are increasing output with lower operating and upkeep costs on every job. See this revolutionary piece of tractor equipment before you consider buying anything in the tractor, excavator, shovel or bulldozer line. Write for complete information. The Eimco Corporation, P. O. Box 300, Salt Lake City, Utah.

EIMCO

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Salt Lake City, Utah, U.S.A.
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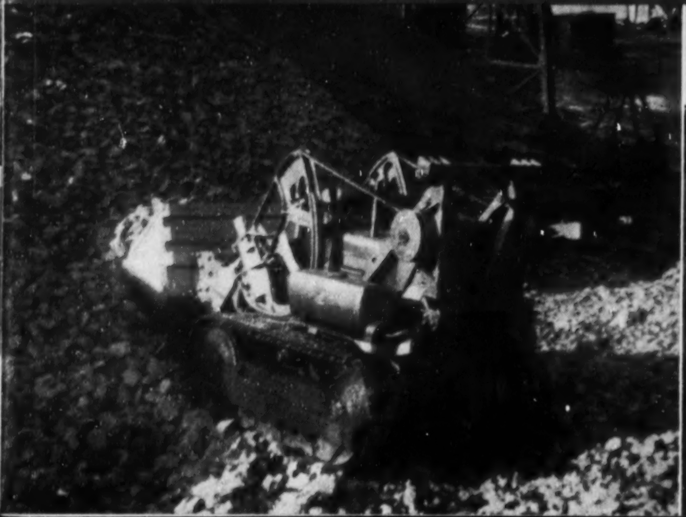
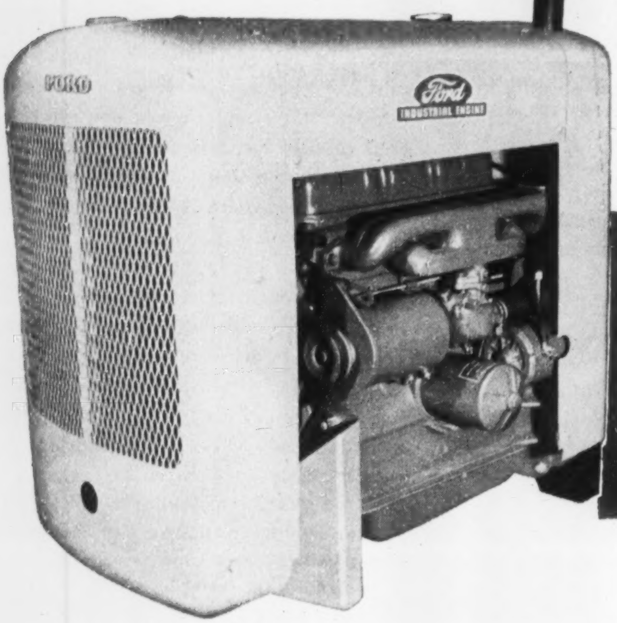
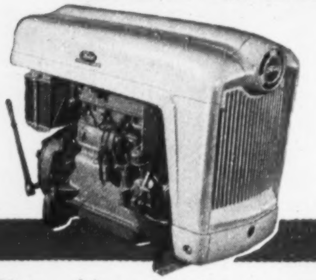


Here's Big News!

FORD'S LATEST "172" CU. IN. ENGINE

★ OVERHEAD-VALVE
★ LARGE BORE
★ SHORT-STROKE
★ DEEP RIGID BLOCK





Pictured here are two types of sheet metal available with this Ford "172" 4-Cyl. Power Unit. Either type can also be specified with the Ford "134" 4-Cyl. Power Unit.

Ford
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AND POWER UNITS

Here is another Ford power plant of the most modern large bore, short-stroke, low-friction design . . . engineered, built and tested *exclusively* for *industrial* applications!

This new Ford engine delivers the mightiest concentration of power *per cubic inch* of any engine of comparable size and weight. With only 172 cu. in. displacement, this 4-cylinder engine attains a maximum of 58 brake horsepower at 2400 rpm. Less displacement normally requires less gas which means greater daily operating economy. Other outstanding features of this new Ford "172" Heavy Duty Industrial Engine are listed below.

Glance through them now and don't hesitate to ask or write for a detailed folder with complete specifications or any other information on the latest in engine design. *Write to:*

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FORD MOTOR COMPANY
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Features that Provide Highest Performance and Outstanding Economy

Large bore (3.90 in.) combined with *short stroke* (3.60) cuts piston travel, reduces friction, delivers more power at clutch and reduces fuel costs.

Deep-skirted crankcase is a feature that provides high structural rigidity for more efficient operation and longer life.

Precision-molded alloy iron crankshaft, fully counter-balanced in motion with mirror-like bearing surfaces that reduce friction to a minimum.

Free-turn valves (intake and exhaust) for even wear to help maintain high compression for longer than average period and reduce the possibility of valve sticking.

Weather-proofed ignition provides molded rubber integral seals for all spark plug terminals and lead wires. Distributor also tightly sealed against dust and dampness.

Full-flow oil filter with full-pressure lubrication contributes to longer engine life.

Autothermic pistons of cam-ground aluminum alloy with steel struts for controlled piston-to-sleeve clearance.

Full-length water jackets surrounding each cylinder to maintain uniform temperature, which in turn minimizes bore distortion and reduces wear.

Fast-acting, fully lubricated, variable speed governor is mounted on crankshaft as an integral part of engine.

Every Ford Industrial Engine from 134 cu. in. to 317 cu. in. is a complete, precision-built "Power Package," delivered fully equipped, tested and ready-to-run. All are available as Engine Assemblies or Complete Power Units with a wide variety of accessories and adaptations to fit your job.

was pouring several parallel walls, he installed the wale supports on every stud at the top wale only. They proved rigid enough to allow a work platform to be erected between the walls with no intermediate shoring. Again there was no evidence of failure or sag. Conver Steel & Wire Corp., 600 E. 132nd St., New York 54, N.Y.

Asphalt bonding additive stable at high temperatures

Pave is the name of a new asphalt bonding additive that is said to offer for the first time heat stability under all temperature conditions encountered in handling, transporting and storing. It is claimed that Pave makes it possible to obtain the advantages of a bonding additive in asphalt cement and hot mixes where high temperatures have driven off other additives.

Results of standard tests indicate that asphalt road materials treated with Pave produce a stronger bond than the untreated asphalts. Further, it is reported that the stronger bond reduces weathering action.

The new product is also a wetting agent for asphalt that overcomes the normal water affinity of crushed rock and other aggregates. The manufacturer says that asphalt materials treated with Pave coat wet surfaces of aggregate in laying new roads and bond to wet surfaces of existing roads when topping and patching. Carlisle Chemical Works, Inc., Reading, Ohio.

Big savings reported with Acetogen, new cutting gas

A new cutting gas is said to sell at 30 to 50 per cent below the cost of acetylene and at the same time yield other advantages. Chief among these is that one cylinder of the new gas is equivalent to four of acetylene.

Acetogen, as the gas is called, consists of purified natural hydrocarbon gases and certain other chemicals. The manufacturers claim that it contains no sulfur, mercaptans, tars or waxes to clog regulators, torches and tips. Mixed with oxygen and ignited the resultant flame has a temperature of 5,400 F.

Further, it is said that the use of Acetogen assures a safer operation because it will not blow back, blow out or explode. It burns with a nonincandescent flame and is non-toxic.

Besides cutting, the gas can also be used for brazing and silver soldering operations because the characteristics

(Continued on page 100)

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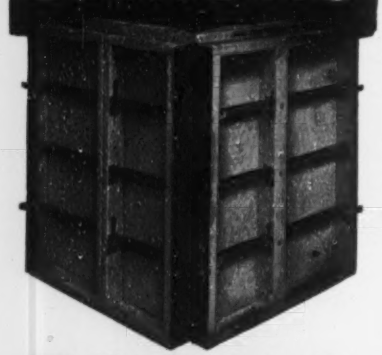

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metal forms for concrete construction

of the flame permit uniform heating of large areas without melting, burning or changing the temper. ACETOGEN CUTTING GAS CO., 26 COURT ST., BROOKLYN 1, N. Y.

New Products . . .

- **Street marker**—A new low-cost marker for streets and highways, Model 1-10, has been developed by the M-B Corp., New Holstein, Wis. Hand-propelled, the marker has a 10-gal paint tank and marks single lines 2½ in. wide. It is said to mark up to 8,000 ft of 4-in. line per hour. The marker is powered by 1-hp air-cooled engine.

- **Sewer-joint packing**—A new non-porous sewer-joint packing, named Ropax, has been developed by Presstite Engineering Co., 3798 Chouteau Ave., St. Louis, 10, Mo. Ropax consists of a processed fibrous core, impregnated and saturated with a blend of selected asphalts. When calked back in the pipe bell, the material is said to form a solid seal impervious to the passage of water. It is available in diameters of ⅜, ½, ¾, 1 and 1¼ in.

- **Measuring tape**—A new steel measuring tape is manufactured with a ¾ in. blade width—most pocket-type blades are ½ in. wide. The extra width is said to enable the blade to be extended to practically its entire 10-ft length without bending or buckling. Another feature of the new King Size is its double markings. One edge is calibrated in 16ths of an inch and is marked off from 1 to 120 in. and the first six inches are marked off in 32nds for accurate work. The other edge is calibrated in feet, inches and eighths. The tapes are manufactured by Evans & Co., Inc., Elizabeth, N. J., and sell for $2.39–$2.49 west of Denver.

Steel prefab has 40-ft clear span

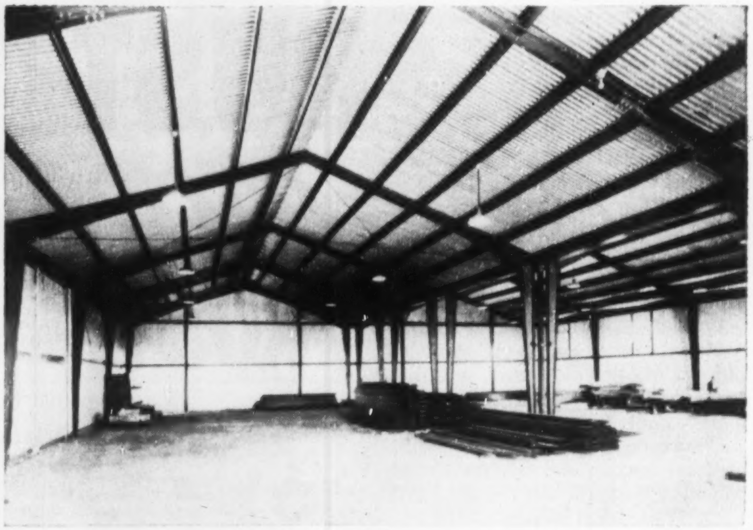
A new all-steel building designed for industrial, commercial and farm uses provides a 40-ft clear span without central columns and a full 14-ft clearance to the eaves. The building adapts to multiple structures by joining at the eaves. Any finished length may be obtained in 20-ft bay lengths.

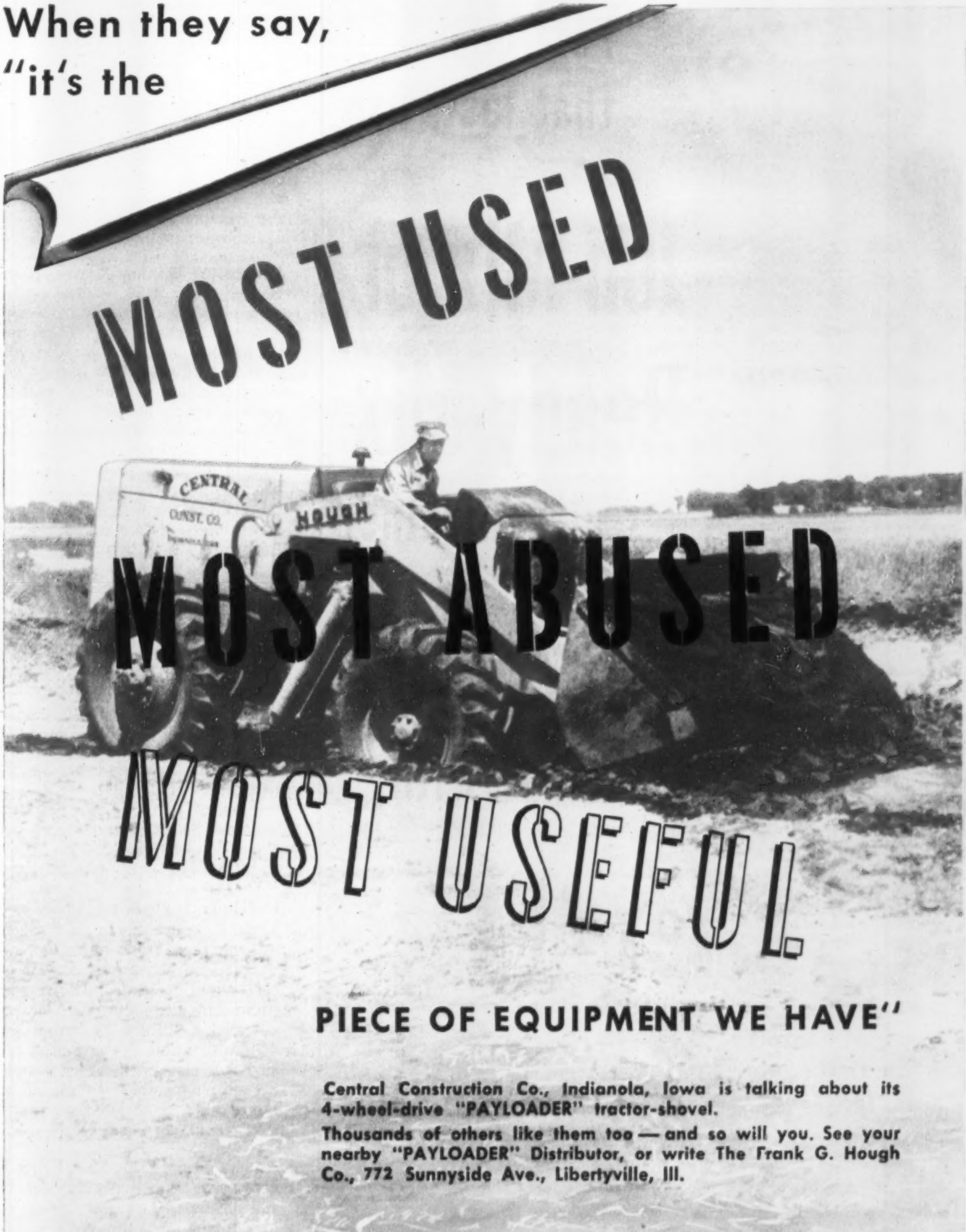
The sides and roof are covered with 24 galvanized box-corrugated sheets. Corrugations are 1-in. deep and 4 in. o.c. Doors with a 20 x 14-ft clear opening height may be located at any side bay or centered in the end of the building. The doors are center-opening. In addition, plain or glazed access doors 3 x 7 ft can be provided in any side bay or end of the building.

Windows may be located in either the upper or lower half of the side or ends. Overhead lighting can be provided by box-corrugated plastic roof sheets, located as desired in the upper half of each side of the roof.

A patented clip and wedge sheet attachment method eliminates all holes through the metal sheets. Required holes elsewhere are predrilled.

A special insulation clip permits attachment of 24-in. hardboard insulation for roofing or side walls. The attachment method is such that an air space is provided between exterior sheets and the insulation. UNITED STEEL FABRICATORS, INC., WOOSTER, OHIO.





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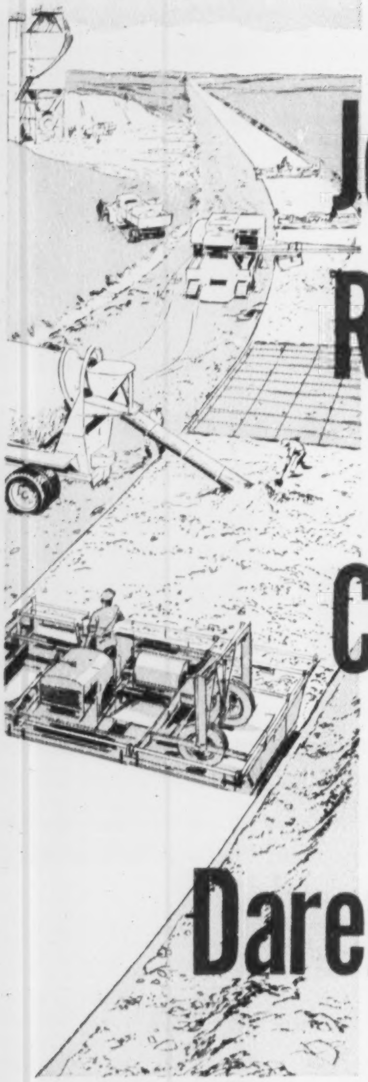

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PUBLICATIONS

Hydraulic pullers—Twin cylinder pullers in capacities from 17½ to 50 tons are illustrated and described in a new 24-page catalog. Application and specifications for each unit are given as well as the accessories to be used with the equipment. OWATONNA TOOL CO., OWATONNA, MINN.

Fluorescent lighting—A new 16-page booklet, Folio P-54, is now available describing a wide variety of plexiglas fluorescent lighting units. These units, the Plexlite line, have molded white plexiglas diffusers and 18-gage cold-rolled steel chassis finished in baked white enamel of 89% reflectivity. The folio is fully illustrated to display the many application possibilities of each of the units, pointing up the almost limitless commercial and institutional lighting design techniques to which the units are suited. GRUBER LIGHTING, 125 S. FIRST ST., BROOKLYN 11, N. Y.

Heating equipment—A new general catalog contains information on commercial-industrial automatic heating and power equipment. Schematic drawings, layouts of typical installations, cutaway views of burners and burner parts and photographs of burners and installations are included among the illustrations. Specifications and detailed data on exclusive features of Petro oil, gas, and combination oil-gas burners are given. Form 3048. PETRO, 3170 W. 106 ST., CLEVELAND 11, OHIO.

Hydraulic controls—Three types of hydraulic controls, both front and rear mounted, available for the operation of scrapers, shovels, loaders, tool bar arrangements and agriculture equipment are discussed in a recent publication entitled "Caterpillar Hydraulic Controls." The 8-page booklet is complete with cutaways and on the job photographs of these controls. Form 3079. CATERPILLAR TRACTOR CO., PEORIA 8, ILL.

Asphalt plants—The Model 848 Barber-Greene asphalt plant is described and illustrated in a new 36-page catalog. In the piece the reader is shown how all of the basic plant components can be combined into four separate plant setups, each designed specifically for a popular application. The function, construction and salient features of each component are discussed and illustrated by drawings, detail pictures and job photographs. The relation of each component to other plant units is likewise presented in this publication. Catalog 848. Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.

Sewage and sump pumps—For engineers, architects and contractors who specify sewage and sump pumps, a comprehensive 8-page bulletin has just been published. It describes in detail three types of pumps: the NKS vertical wet pit single or duplex; the NKV vertical dry pit; and the NKH horizontal. Specifications are given for all types and optional equipment is illustrated and explained. Performance tables are supplied according to pump capacity and detailed help is given for selecting the correct pump. Write for Bulletin No. 352-A 12. American-Marsh Pumps, Inc., Battle Creek, Mich.

Transite ducts—A new 12-page brochure covers installation and maintenance information on Transite conduit for exposed work and installation underground without concrete encasement and Transite Korduct for installation in concrete. Fully illustrated, the brochure cites typical examples from public utilities, telephone companies and other industries which show how Transite duct materials can cut cable subway costs. Johns-Manville, 22 E. 40th St., New York 16, N. Y.

Perlite plaster—"How to Specify and Use Perlite Plaster Aggregate" is a new 8-page, 2-color brochure now available. The brochure contains helpful specification data, information on the perlite industry's certification and labeling program for plaster aggregate, and four pages of practical hints on the cause and prevention of cracks in all types of plaster. Perlite Institute, 10 E. 40th St., New York 16, N. Y.

Underground insulation—A new 20-page Technical Data Manual gives engineers information on the application of Gilsulate, a new insulation for hot underground pipes. The manual describes the three grades of the product, how ditch sizes are determined for various pipes and types of soil, how the efficiency of insulation is calculated and how the performance of a particular job can be predicted. Numerous charts, tables, drawings and graphs are used throughout the Manual. American Gilsonite Co., 134 W. Broadway, Salt Lake City, Utah.

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EDITORIALS

Leadership for the St. Lawrence

NAMING OF ROBERT MOSES to head the Power Authority of the State of New York will be applauded by all who know his capacity for getting things done. Building the St Lawrence power development jointly with the Hydro-Electric Power Commission of Ontario is a task needing that sort of direction.

Developing more power at Niagara Falls, however, is not in the same category. This job can be done readily by the private power company now on the ground there—and be just as effectively in the public interest. So we hope that Mr. Moses quickly loses his first battle —to have the Niagara job turned over to the state power authority—and thus he will be able to devote his entire energy and great ability to the St. Lawrence project.

A union is still a union

RENEWED DISCUSSION of the pros and cons of unionization for engineers, as in the A.S.C.E. Washington meeting (ENR March 18, p.21), has come at a very appropriate time, because two recent surveys of young engineers have shown that a considerable number believe that some form of collective bargaining would be of help to them economically. The Washington meeting provides a partial answer to the character of service that is available to these men in one organization—Engineers and Scientists of America—that set out originally to provide engineers with a type of bargaining group that they could join without sacrifice of professional standards. In brief, that service has deteriorated to the point where it is no different from any trade union.

ESA is made up of several unions of men whose positions have been classified by the National Labor Relations Board as predominantly professional. All are independent of the AFL or CIO. The president of ESA, Joseph Amann, was the chief proponent of unionization when the subject was discussed at the Washington meeting.

Now it is significant to note that, at the same time, one of the most active ESA unions, the Engineers Association at the Sperry Gyroscope Co. plant on Long Island, N. Y., was on strike. We do not know the merits of that labor controversy, but regardless of causes or justification, it had all the earmarks of a trade-union fight. At the start there were even picket lines to keep other unionized men, having no dispute with management, from their jobs.

Generalizations always are dangerous. Other organizations now in the ESA, notably the TVA Engineers Association and some groups on the West Coast, appear to have been successful in keeping their bargaining on a higher level. Yet as Mr. Amann stated at the Washington meeting, none of the strategic practices of trade unions—such as insistence on a union shop—now is barred by ESA.

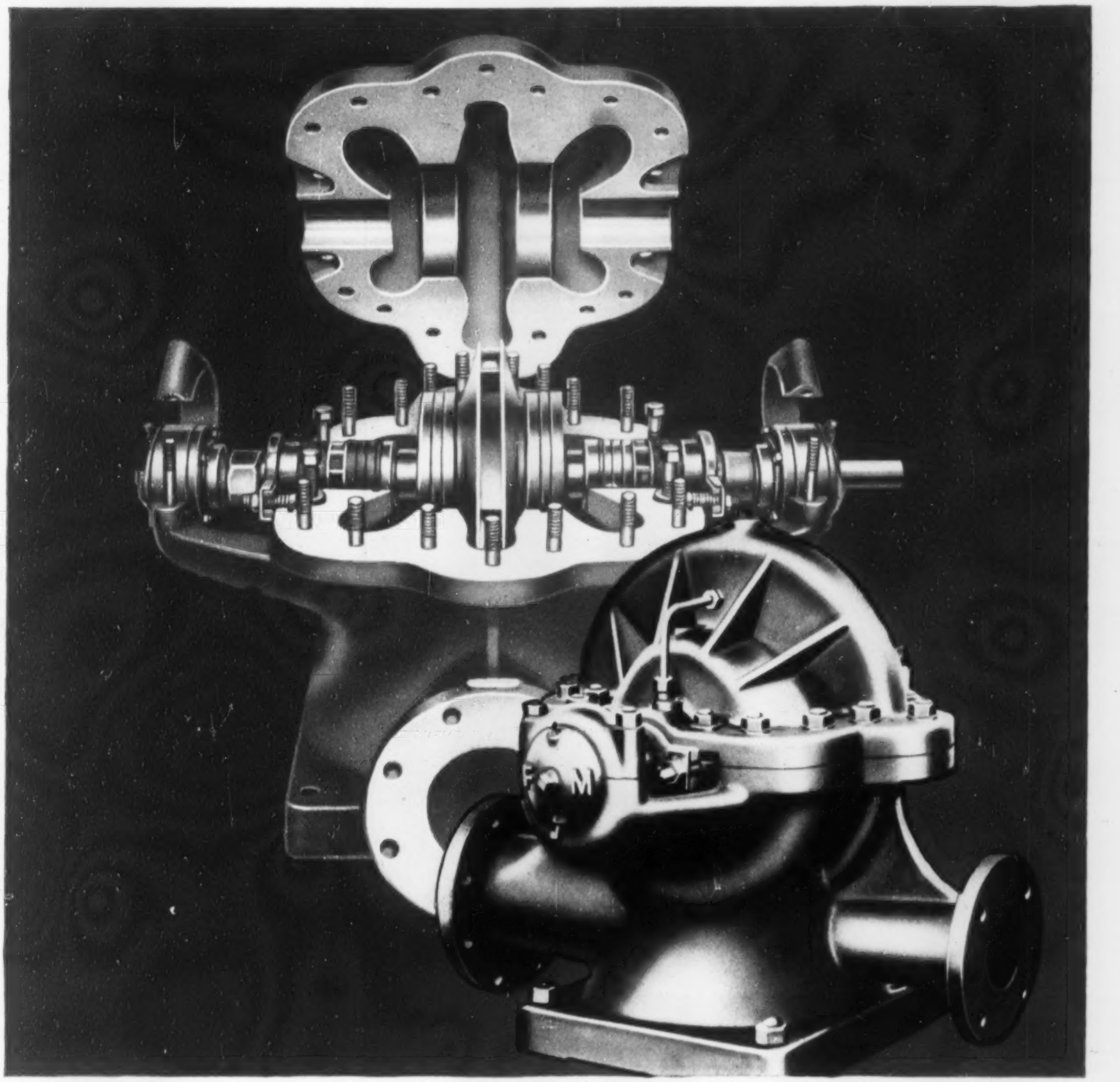
These events must raise grave doubts in the mind of the young engineer. If one organization in ESA can take such steps, then any unit can. Hence the fact that some of the collective-bargaining groups now in ESA have not resorted to such tactics is of doubtful significance. Basically, ESA standards have been lowered to the point where membership at the present time in ESA is no different from membership in any trade union.

Unionized turnpike engineers

UNIONIZATION of subprofessional men, and possibly some in the professional classifications of the National Labor Relations Board, on the staff of contractors on the Ohio Turnpike (ENR March 18, p.23) brings discussion of the subject of unionization of engineers right down to earth. The movement in Ohio is not new. It is an extension of what has happened in the past in California and a few other places. The significance in Ohio is indicated by the fact that the movement has been started in a state where the registered engineers have a strong organization—the Ohio Society of Professional Engineers—that should be able to keep the movement from involving any considerable number of professional employes if any such organization can.

In considering the Ohio situation it is essential to recognize the distinction between professional employes and subprofessional men. Apparently, the men who have been organized as Local 18C of the International Union of Operating Engineers, AFL, are mostly subprofessional—rodmen, chainmen and instrumentmen on the survey parties doing layout work for the contractors. Whether that type of employe can be kept from joining a union in sufficient numbers to obtain certification by the NLRB may be problematical. Nevertheless, those individuals who have the desire to avoid unionization—such as young graduate engineers who are getting their start in that type of work—should receive all the help and encouragement possible.

It is in fighting to keep men in real professional positions from being compelled to join a union against their will that the Ohio Society of Professional Engineers will be on firmer ground. It will get effective help from the NLRB if it can demonstrate that a majority of the men whom the NLRB classifies as professional do not want to be unionized. It may be a hard fight, which could tie up work on the turnpike temporarily, but it will be worth the price. In making the fight, the society should have the support of every engineer in the state.



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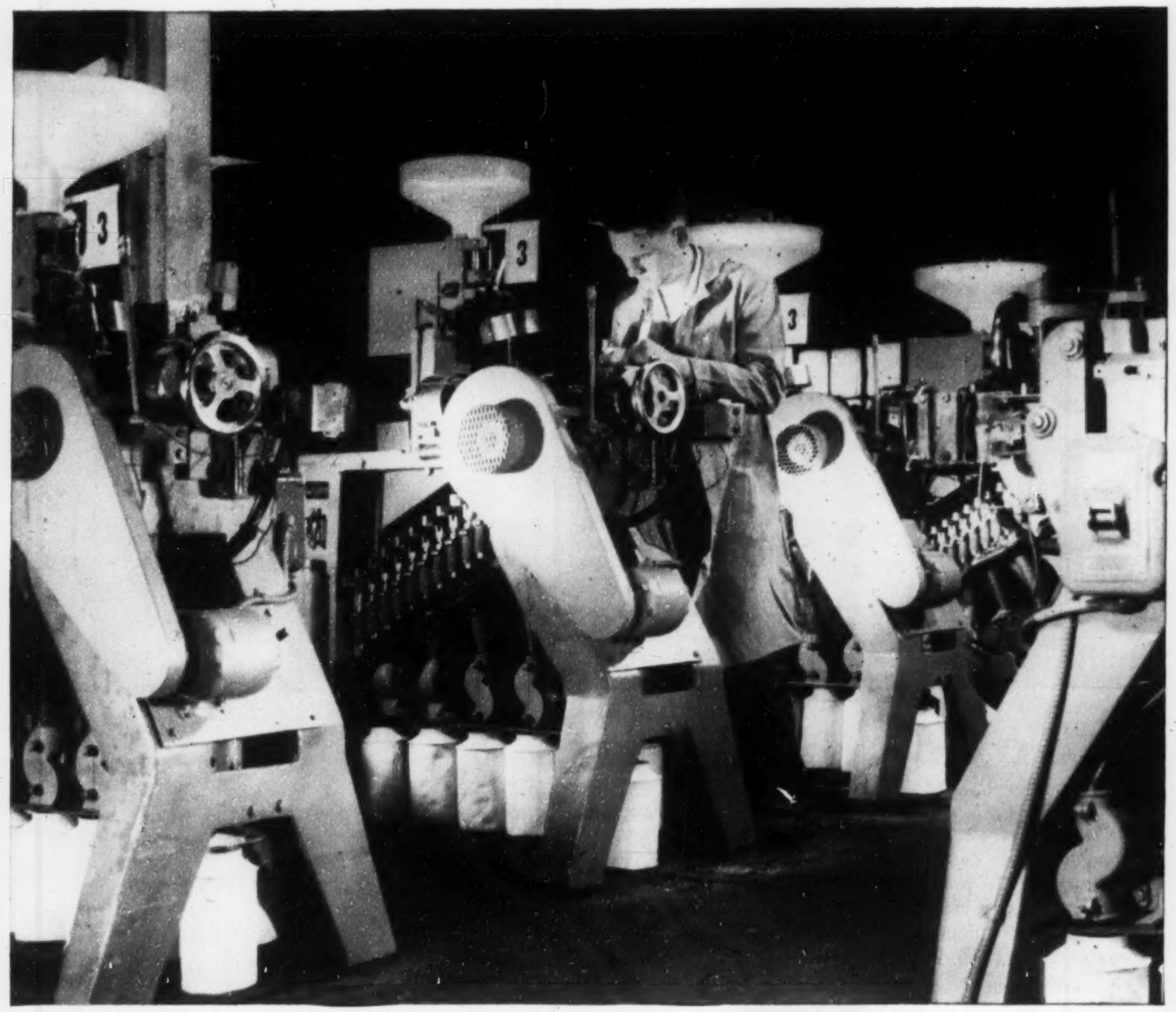

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